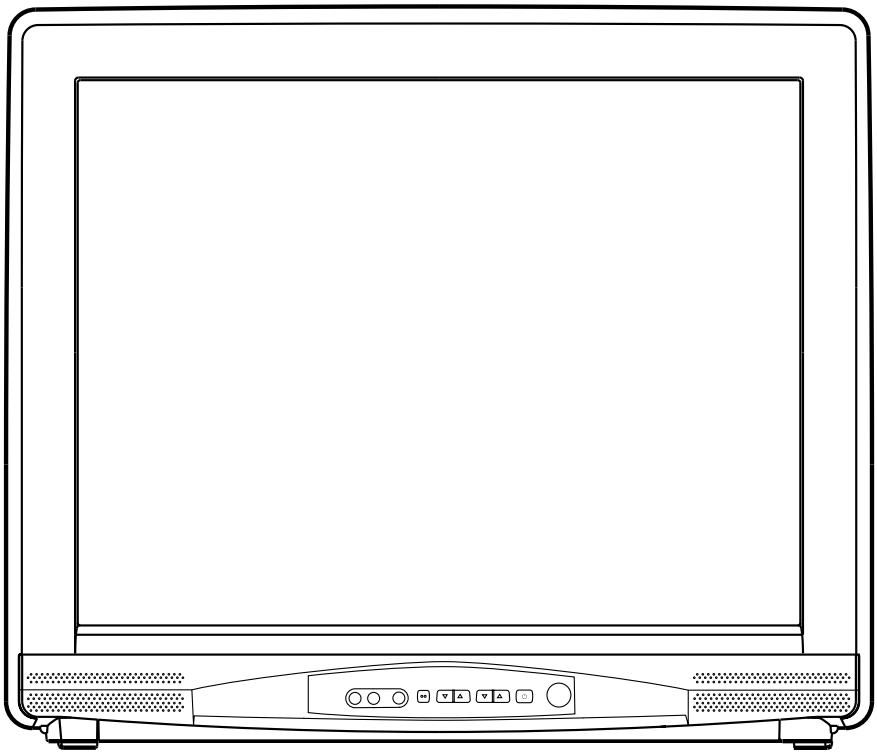
Symphonic

SERVICE MANUAL

27" COLOR TELEVISION

WF2703



IMPORTANT SAFETY NOTICE

Proper service and repair is important to the safe, reliable operation of all Funai Equipment. The service procedures recommended by Funai and described in this service manual are effective methods of performing service operations. Some of these service special tools should be used when and as recommended.

It is important to note that this service manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Funai could not possibly know, evaluate and advice the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Funai has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Funai must first use all precautions thoroughly so that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

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SPECIFICATIONS

<TUNER>

ANT. Input ---------- 75ohm Unbal., F type
Reference Level ---------- 20Vp-p (CRT Green Cathode)
Test Input Signal ---------- 400Hz 30% modulation

Description	Condition	Unit	Nominal	Limit
1. Intermediate Freq.	Picture	MHz	45.75	–
	Sound	MHz	41.25	–
2. Peak Picture Sens	VHF	dBμv	15	30
	CATV	dBμv	15	30
	UHF	dBμv	15	40
3. AFT Pull In Range (10mV input)	–	MHz	±2.0	±0.7

<DEFLECTION>

Description	Condition	Unit	Nominal	Limit
1. Deflection Freq.	Horizontal	KHz	15.734	–
	Vertical	Hz	60	–
2. Linearity	Horizontal	%	–	±15
	Vertical	%	–	±10
3. Over Scan	–	%	10	–
4. High Voltage	–	KV	29	–

<VIDEO & CHROMA>

Description	Condition	Unit	Nominal	Limit
1. Misconvergence	Center	mm	–	0.4
	Side	mm	–	1.5
	Corner	mm	–	2.1
2. Brightness	APL 100%	Ft-L	25	15
3. Color Temperature	–	°K	9200°K	–
4. Resolution	Horizontal	Line	250	–
	Vertical	Line	300	–

<AUDIO>

All items are measured across 8Ω load at speaker output terminal.

Description	Condition	Unit	Nominal	Limit
1. Audio Output Power	10% THD	W	1	0.8
2. Audio Distortion (w/LPF)	500mW	%	2	7
3. Audio Freq. Response	-3dB	Hz	70~11K	–

Note:

Nominal specifications represent the design specifications. All units should be able to approximate these. Some will exceed and some may drop slightly below these specifications. Limit specifications represent the absolute worst condition that still might be considered acceptable. In no case should a unit fail to meet limit specifications.

IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, our products are strictly inspected for recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

Safety Precautions for TV Circuit

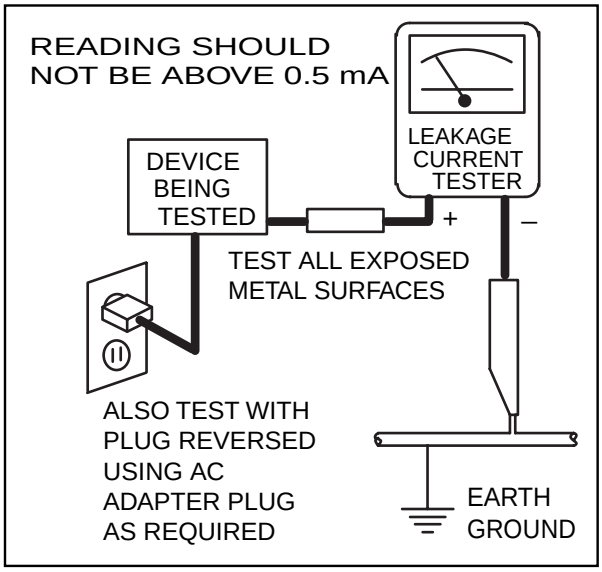
1. **Before returning an instrument to the customer,** always make a safety check of the entire instrument, including, but not limited to, the following items:

a. Be sure that no built-in protective devices are defective and have been defeated during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. **Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damage.**

b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, (1) spacing between the picture tube and the cabinet mask, (2) excessively wide cabinet ventilation slots, and (3) an improperly fitted and/or incorrectly secured cabinet back cover.

c. **Antenna Cold Check -** With the instrument AC plug removed from any AC source, connect an electrical jumper across the two AC plug prongs. Place the instrument AC switch in the on position. Connect one lead of an ohmmeter to the AC plug prongs tied together and touch the other ohmmeter lead in turn to each tuner antenna input exposed terminal screw and, if applicable, to the coaxial connector. If the measured resistance is less than 1.0 megohm or greater than 5.2 megohm, an abnormality exists that must be corrected before the instrument is returned to the customer. Repeat this test with the instrument AC switch in the off position.

d. **Leakage Current Hot Check -** With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1410, (50.7). With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinet, screw heads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milli-ampere. Reverse the instrument power cord plug in the outlet and repeat the test.



ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR BEFORE CONNECTING THE ANTENNA OR ACCESSORIES.

e. **X-Radiation and High Voltage Limits -** Because the picture tube is the primary potential source of X-radiation in solid-state TV receivers, it is specially constructed to prohibit X-radiation emissions. For continued X-radiation protection, the replacement picture tube must be the same type as the original. Also, because the picture tube shields and mounting hardware perform an X-radiation protection function, they must be correctly in place. High voltage must be measured each time servic-

ing is performed that involves B+, horizontal deflection or high voltage. Correct operation of the X-radiation protection circuits also must be reconfirmed each time they are serviced. (X-radiation protection circuits also may be called "horizontal disable" or "hold down.") Read and apply the high voltage limits and, if the chassis is so equipped, the X-radiation protection circuit specifications given on instrument labels and in the Product Safety & X-Radiation Warning note on the service data chassis schematic. High voltage is maintained within specified limits by close tolerance safety-related components/adjustments in the high-voltage circuit. If high voltage exceeds specified limits, check each component specified on the chassis schematic and take corrective action.

2. Read and comply with all caution and safety-related notes on or inside the receiver cabinet, on the receiver chassis, or on the picture tube.

3. Design Alteration Warning - Do not alter or add to the mechanical or electrical design of this TV receiver. Design alterations and additions, including, but not limited to circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this receiver and create a hazard to the user. Any design alterations or additions will void the manufacturer's warranty and may make you, the servicer, responsible for personal injury or property damage resulting therefrom.

4. Picture Tube Implosion Protection Warning - The picture tube in this receiver employs integral implosion protection. For continued implosion protection, replace the picture tube only with one of the same type number. Do not remove, install, or otherwise handle the picture tube in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while picture tubes are handled. Keep the picture tube away from your body. Do not handle the picture tube by its neck. Some "in-line" picture tubes are equipped with a permanently attached deflection yoke; because of potential hazard, do not try to remove such "permanently attached" yokes from the picture tube.

5. Hot Chassis Warning -

a. Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord and maybe safety-serviced without an isolation transformer only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC power source. To confirm that the AC power plug is inserted correctly, with an AC voltmeter, measure between the chassis and a known earth ground. If a voltage reading in excess of 1.0V is obtained, remove and reinsert the AC power plug in the opposite polarity and again measure the voltage potential between the chassis and a known earth ground.

b. Some TV receiver chassis normally have 85V AC(RMS) between chassis and earth ground regardless of the AC plug polarity. This chassis can be safety-serviced only with an isolation transformer inserted in the power line between the receiver and the AC power source, for both personnel and test equipment protection.

c. Some TV receiver chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the AC power line. The two ground systems are electrically separated by insulation material that must not be defeated or altered.

6. Observe original lead dress. Take extra care to assure correct lead dress in the following areas:a. near sharp edges,b. near thermally hot parts-be sure that leads and components do not touch thermally hot parts,c. the AC supply,d. high voltage, and,e. antenna wiring. Always inspect in all areas for pinched, out of place, or frayed wiring. Check AC power cord for damage.

7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

8. Product Safety Notice - Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc.. Parts that have special safety characteristics are identified by a (⚠) on schematics and in parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. The product's safety is under review continuously and new instructions are issued whenever appropriate. Prior to shipment from the factory, our products are strictly inspected to confirm they comply with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

Precautions during Servicing

A. Parts identified by the (⚠) symbol are critical for safety.
Replace only with part number specified.

B. In addition to safety, other parts and assemblies are specified for conformance with regulations applying to spurious radiation. These must also be replaced only with specified replacements.

Examples: RF converters, RF cables, noise blocking capacitors, and noise blocking filters, etc.

C. Use specified internal wiring. Note especially:

1) Wires covered with PVC tubing
2) Double insulated wires
3) High voltage leads

D. Use specified insulating materials for hazardous live parts. Note especially:

1) Insulation Tape
2) PVC tubing
3) Spacers
4) Insulators for transistors.

E. When replacing AC primary side components (transformers, power cord, etc.), wrap ends of wires securely about the terminals before soldering.

F. Observe that the wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

G. Check that replaced wires do not contact sharp edged or pointed parts.

H. When a power cord has been replaced, check that 5~6 kg of force in any direction will not loosen it.

I. Also check areas surrounding repaired locations.

J. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

K. Crimp type wire connector

The power transformer uses crimp type connectors which connect the power cord and the primary side of the transformer. When replacing the transformer, follow these steps carefully and precisely to prevent shock hazards.
Replacement procedure

1) Remove the old connector by cutting the wires at a point close to the connector.
Important: Do not re-use a connector (discard it).
2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.
3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.
4) Use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

L. When connecting or disconnecting the internal connectors, first, disconnect the AC plug from the AC supply outlet.

Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Clearance Distance

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. (See Fig. 1)

Table 1 : Ratings for selected area

AC Line Voltage	Region	Clearance Distance (d) (d')
110 to 130 V	USA or CANADA	≥ 3.2 mm (0.126 inches)

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

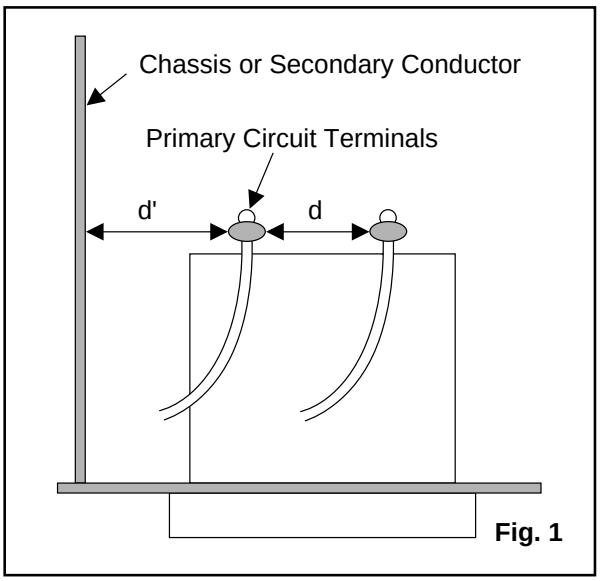


Fig. 1

2. Leakage Current Test

Confirm the specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) is lower than or equal to the specified value in the table below.

Measuring Method : (Power ON)

Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See Fig. 2 and following table.

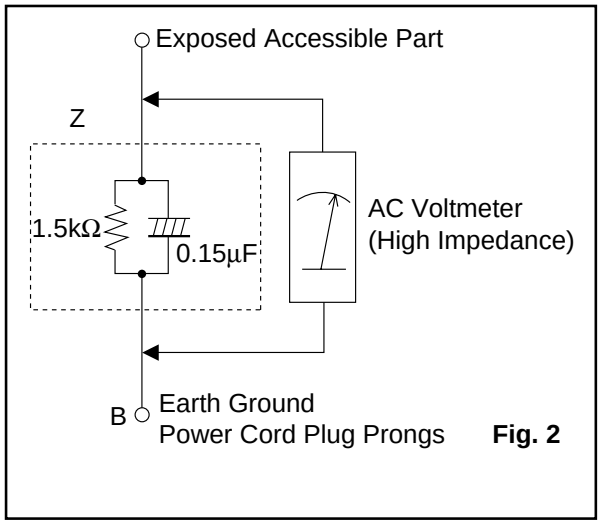


Fig. 2

Table 2 : Leakage current ratings for selected areas

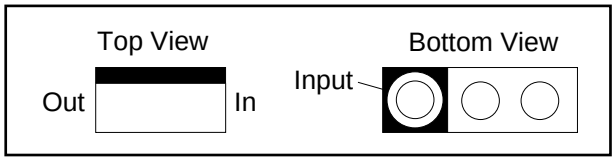
AC Line Voltage	Region	Load Z	Leakage Current (i)	Earth Ground (B) to:
110 to 130 V	USA	0.15µF CAP. & 1.5kΩ RES. connected in parallel	i≤0.5mA rms	Exposed accessible parts

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

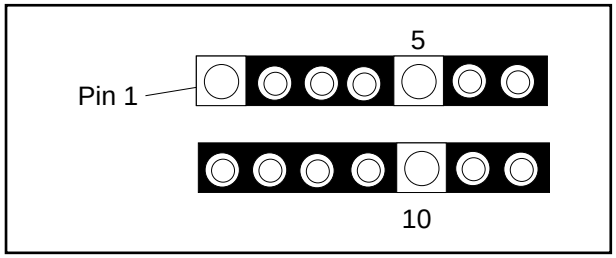
STANDARD NOTES FOR SERVICING

Circuit Board Indications

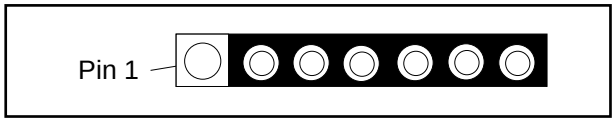
a. The output pin of the 3 pin Regulator ICs is indicated as shown.



b. For other ICs, pin 1 and every fifth pin are indicated as shown.



c. The 1st pin of every male connector is indicated as shown.



How to Remove / Install Flat Pack-IC

1. Removal

With Hot-Air Flat Pack-IC Desoldering Machine:

(1) Prepare the hot-air flat pack-IC desoldering machine, then apply hot air to the Flat Pack-IC (about 5 to 6 seconds). (Fig. S-1-1)

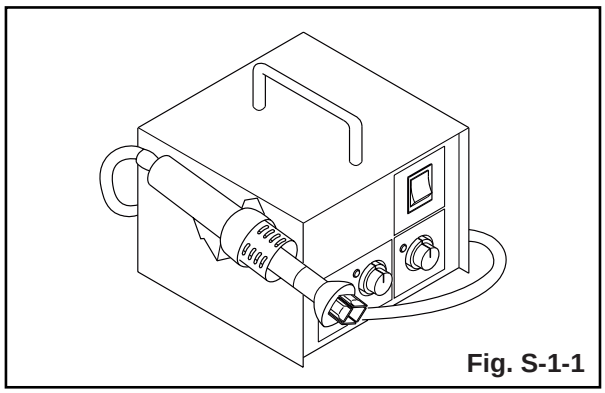


Fig. S-1-1

(2) Remove the flat pack-IC with tweezers while applying the hot air.

(3) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)

(4) Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

Caution:

1. Do not supply hot air to the chip parts around the flat pack-IC for over 6 seconds because damage to the chip parts may occur. Put masking tape around the flat pack-IC to protect other parts from damage. (Fig. S-1-2)
2. The flat pack-IC on the CBA is affixed with glue, so be careful not to break or damage the foil of each pin or the solder lands under the IC when removing it.

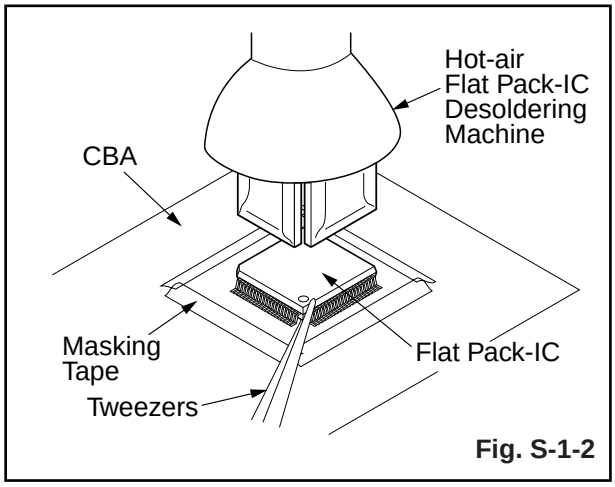


Fig. S-1-2

With Soldering Iron:

(1) Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)

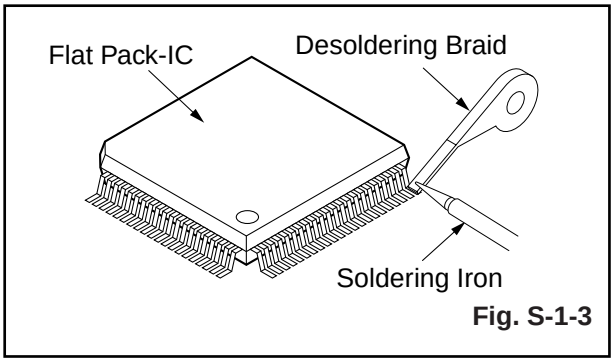


Fig. S-1-3

(2) Lift each lead of the flat pack-IC upward one by one, using a sharp pin or wire to which solder will not adhere (iron wire). When heating the pins, use a fine tip soldering iron or a hot air desoldering machine.(Fig. S-1-4)

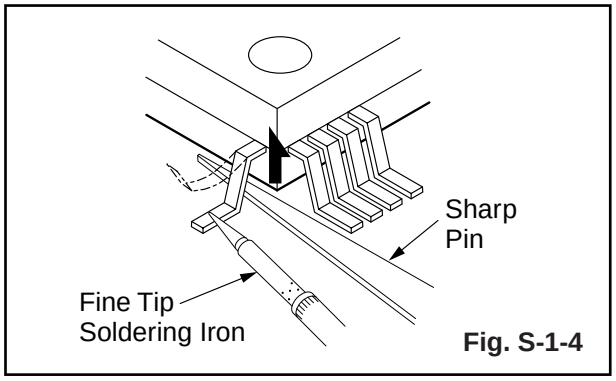


Fig. S-1-4

(3) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)

(4) Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

With Iron Wire:

(1) Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)

(2) Affix the wire to a workbench or solid mounting point, as shown in Fig. S-1-5.

(3) While heating the pins using a fine tip soldering iron or hot air blower, pull up the wire as the solder melts so as to lift the IC leads from the CBA contact pads as shown in Fig. S-1-5.

(4) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)

(5) Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

Note:

When using a soldering iron, care must be taken to ensure that the flat pack-IC is not being held by glue. When the flat pack-IC is removed from the CBA, handle it gently because it may be damaged if force is applied.

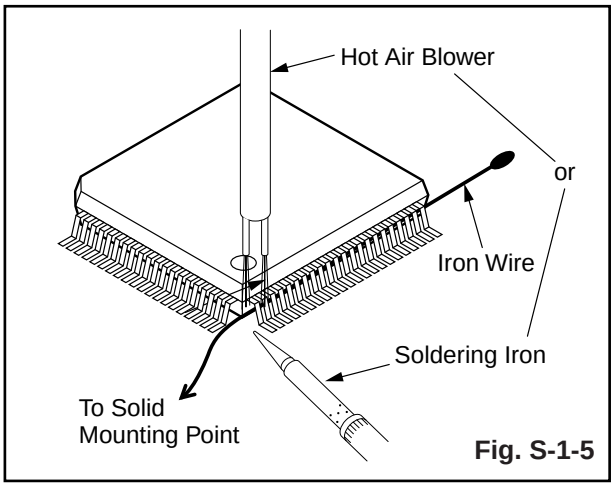


Fig. S-1-5

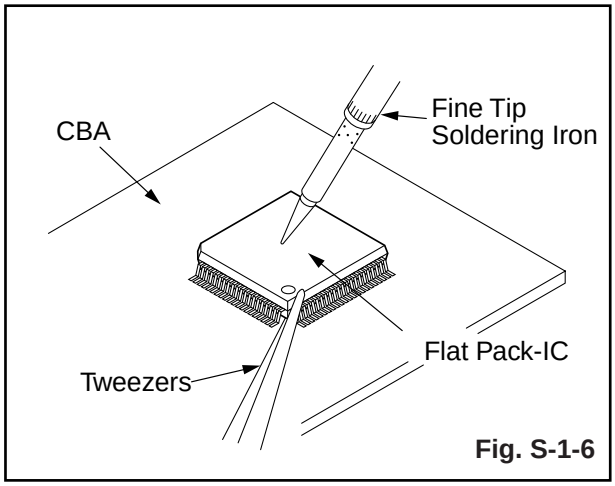


Fig. S-1-6

2. Installation

(1) Using desoldering braid, remove the solder from the foil of each pin of the flat pack-IC on the CBA so you can install a replacement flat pack-IC more easily.

(2) The "●" mark on the flat pack-IC indicates pin 1. (See Fig. S-1-7.) Be sure this mark matches the 1 on the PCB when positioning for installation. Then pre- solder the four corners of the flat pack-IC. (See Fig. S-1-8.)

(3) Solder all pins of the flat pack-IC. Be sure that none of the pins have solder bridges.

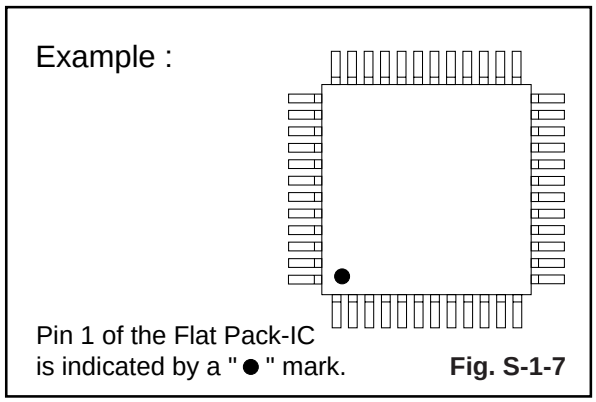


Fig. S-1-7

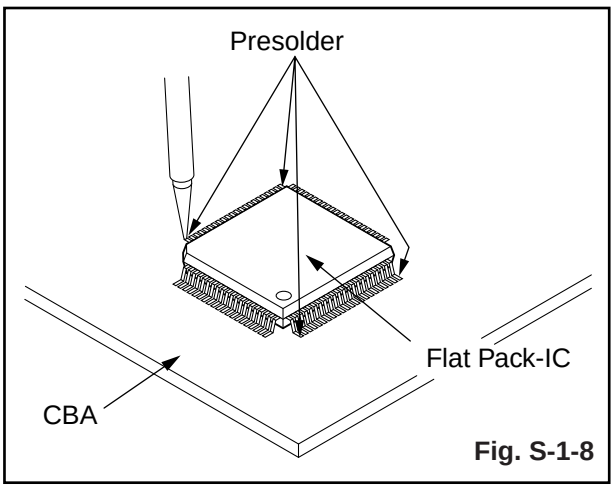


Fig. S-1-8

Instructions for Handling Semiconductors

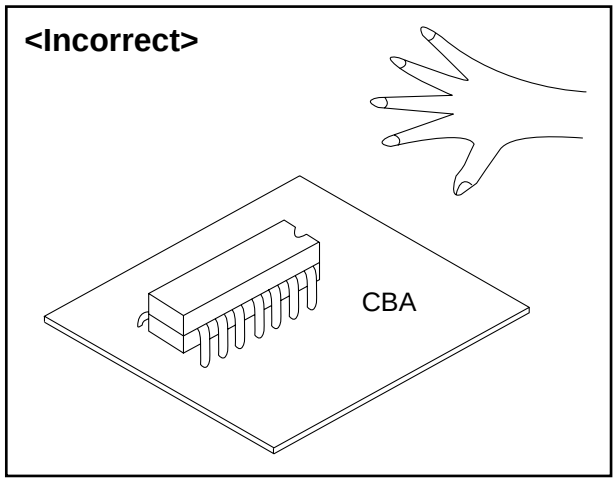
Electrostatic breakdown of the semiconductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

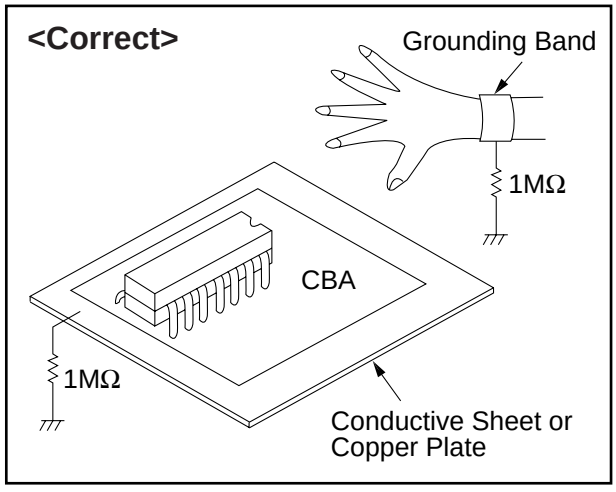
1. Ground for Human Body

Be sure to wear a grounding band (1MΩ) that is properly grounded to remove any static electricity that may be charged on the body.

2. Ground for Workbench

Be sure to place a conductive sheet or copper plate with proper grounding (1MΩ) on the workbench or other surface, where the semiconductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting semiconductors with your clothing.





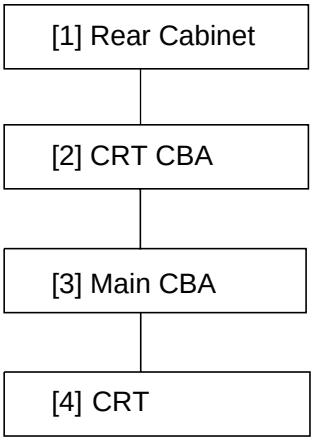
CABINET DISASSEMBLY INSTRUCTIONS

1. Disassembly Flowchart

This flowchart indicates the disassembly steps for the cabinet parts, and the CBA in order to gain access to item(s) to be serviced. When reassembling, follow the steps in reverse order. Bend, route and dress the cables as they were.

Caution !

When removing the CRT, be sure to discharge the Anode Lead of the CRT with the CRT Ground Wire before removing the Anode Cap.



2. Disassembly Method

Step/ Loc. No.	Part	Removal		
		Fig. No	Remove/*unlock/ release/unplug/ unclamp/desolder	Note
[1]	Rear Cabinet	1,2	7(S-1), 1(S-2), 1(S-4)	1
[2]	CRT CBA	4,5	CN501	2
[3]	Main CBA	3,5	CN571	3
[4]	CRT	4	4(S-3), Anode Cap	4
↓ (1)	↓ (2)	↓ (3)	↓ (4)	↓ (5)

Note :

(1) Order of steps in procedure. When reassembling, follow the steps in reverse order.These numbers are also used as the Identification (location) No. of parts in figures.

(2) Parts to be removed or installed.

(3) Fig. No. showing procedure of part location

(4) Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.

S=Screw, P=Spring, L=Locking Tab, CN=Connector, *=Unhook, Unlock, Release, Unplug, or Desolder

2(S-2) = two Screws (S-2)

(5) Refer to the following "Reference Notes in the Table."

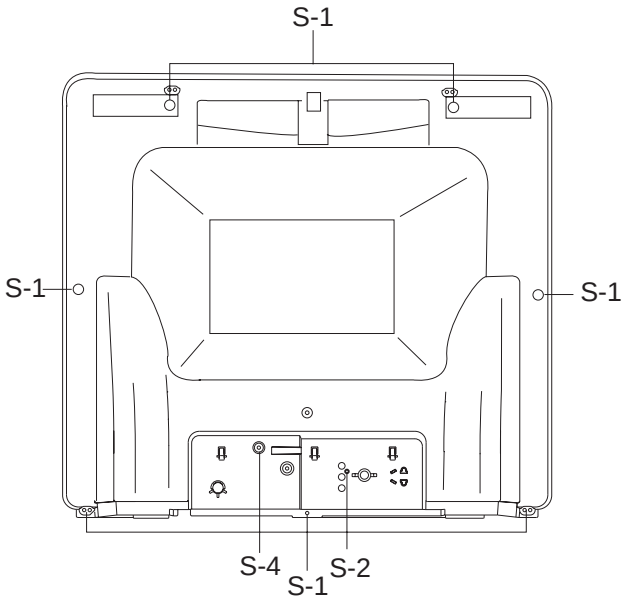
Reference Notes in the Table

1. Removal of the Rear Cabinet. Remove screws 7(S-1), 1(S-2) and 1(S-4) then slide the Rear Cabinet backward.
2. Removal of the CRT CBA. Disconnect CN501 then pull the CRT CBA backward.
3. Removal of the Main CBA. Disconnect CN571 on the Main CBA then slide the Main CBA backward.

Caution:

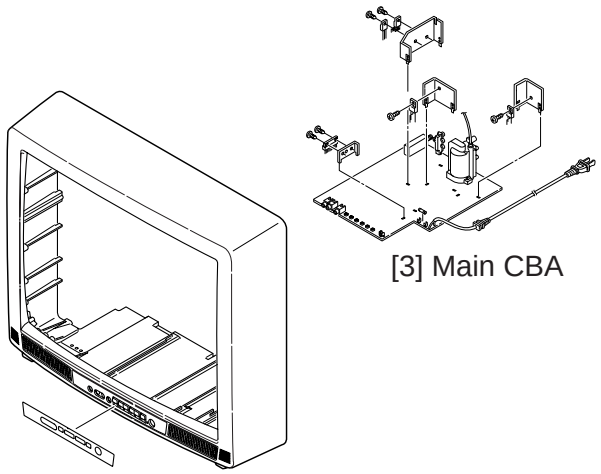
Discharge the Anode Lead of the CRT with the CRT Ground Wire before removing the Anode Cap.

4. Removal of the CRT. Remove screws 4(S-3) and Anode Cap. then slide the CRT backward.



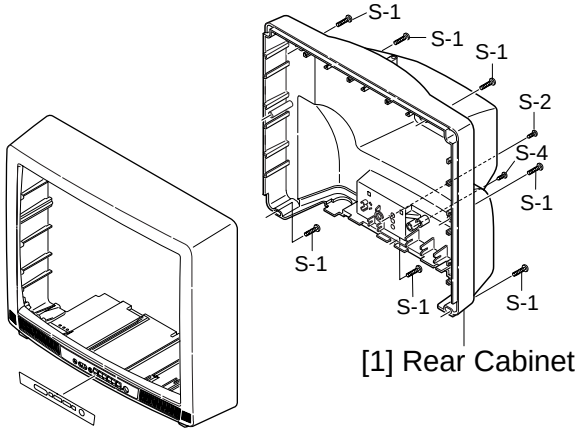
[1] Rear Cabinet

Fig. 1



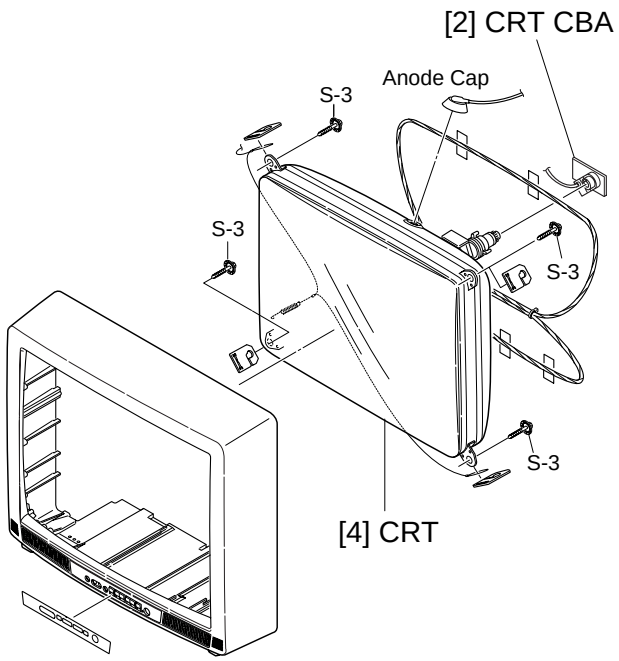
[3] Main CBA

Fig. 3



[1] Rear Cabinet

Fig. 2



[4] CRT

Fig. 4

TV Cable Wiring Diagram

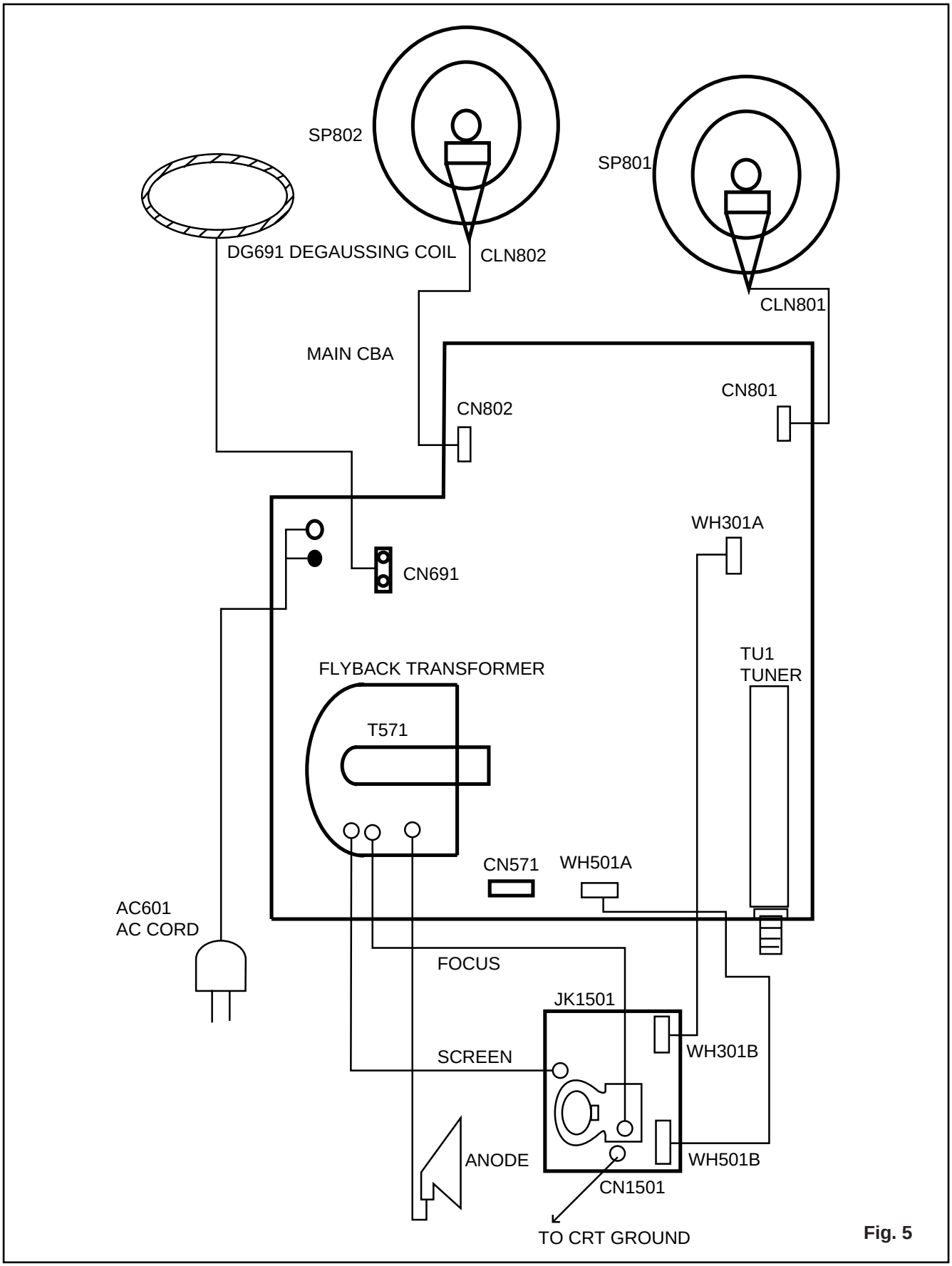


Fig. 5

ELECTRICAL ADJUSTMENT INSTRUCTIONS

General Note:
"CBA" is abbreviation for "Circuit Board Assembly".

NOTE:

Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed.
Also, do not attempt these adjustments unless the proper equipment is available.

Test Equipment Required

1. NTSC Pattern Generator (Color Bar W/White Window, Red Color, Dot Pattern, Gray Scale, Monoscope, Multi-Burst)
2. DC Voltmeter
3. Oscilloscope: Dual-trace with 10:1 probe,
   V-Range:0.001~50V/Div,
   F-Range:DC~AC-60MHz
4. Plastic Tip Driver
5. Remote control unit:Part No. N0127UD or N0132UD or N0105UD or N0108UD
6. DC power supply 13.2V/5A

How to make Service remote control unit:

1. Prepare normal remote control unit. (Part No. N0127UD or N0132UD or N0105UD or N0108UD) Remove 3 Screws from the back lid. (Fig. 1-1)
2. Add J1 (Jumper Wire) to the remote control CBA. (Fig. 1-2)

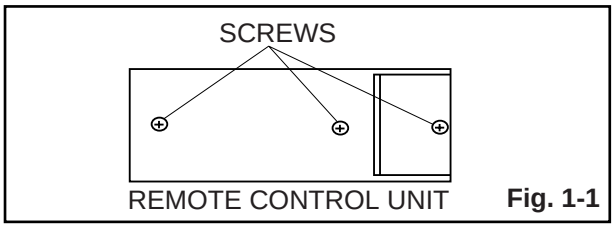


Fig. 1-1

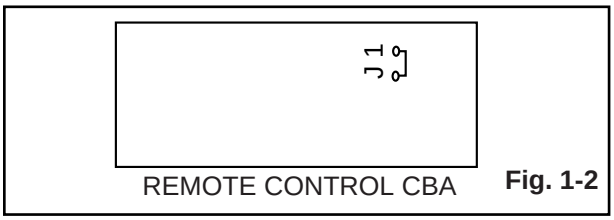


Fig. 1-2

1. DC 120V Adjustment

Purpose: To obtain correct operation.

Symptom of Misadjustment: The picture is dark and the unit does not operate correctly.

Test Point	Adj. Point	Mode	Input
TP601(+120) TP300(GND)	VR661	---	---
Tape	**M. EQ.**	**Spec.**	
---	DC Voltmeter	+120±0.5V DC.	

Note:TP601, TP300(GND), VR661 --- Main CBA

1. Connect DC Volt Meter to TP601 and TP300(GND).
2. Adjust VR661 so that the voltage of TP601 becomes +120±0.5V DC.

2. Black Strech Control Adjustment

Purpose: To show the fine black color.

Symptom of Misadjustment: Black color will not appear correctly.

Note: Use Service remote control unit.

1. Enter the Service mode. (See page 5-1)
2. Press " 6 " button on the Service remote control unit. " B-S " is indicated.
3. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that display will change " OFF ", " 0 ", " 1 ", " 2 " and " 3 ". Then choose " B-S OFF ".
4. Press " 6 " button on the Service remote control unit. " B-S*2 " is indicated.
5. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that display will change " 0 " and " 1 ". Then choose " B-S*2 0".
6. Turn the power off and on again. (Main power button on the TV unit.)

3-1. Setting for 7F and FRENCH data Values

General

1. Enter the Service mode. (See page 5-1)
2. Press " VOL ▼ " button on the Service remote control unit. Display changes " C/D ", " 7F ", " FRENCH ", " ACCESS CODE ", " STEREO ", " VIDEO TONE ", " FM-MODE ", and " V-OUT " cyclically when " VOL ▼ " button is pressed.

7F

1. Press " VOL ▼ " button on the Service remote control unit. Then select 7F display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit. Then choose 7F=FF.

FRENCH

1. Press " VOL ▼ " button on the Service remote control unit. Then select FRENCH display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit. Then choose FRENCH=OFF.

ACCESS CODE ---- set to OFF
VIDEO TONE ---- set to ON
FM-MODE ---- set to OFF
V-OUT ---- set to OFF
STEREO ---- set to ON

Note: C/D and **VCO** data values do not need to be adjusted at this moment.

3-2. Setting for CONTRAST, COLOR, TINT, V-TINT and SHARP data Values

General

1. Enter the Service mode. (See page 5-1)
2. Press " MENU " button on the Service remote control unit. Display changes " BRIGHT ", " CONTRAST ", " COLOR ", " TINT ", " V-TINT " and " SHARP " cyclically when " MENU " button is pressed.

CONTRAST (CNT)

1. Press " MENU " button on the Service remote control unit. Then select " CONTRAST " (CNT) display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the value of " CONTRAST " (CNT) becomes 84.

COLOR (CLR)

1. Press " MENU " button on the Service remote control unit. Then select " COLOR " (CLR) display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the value of " COLOR " (CLR) becomes 58.

TINT (TNT)

1. Press " MENU " button on the Service remote control unit. Then select " TINT " (TNT) display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the value of " TINT " (TNT) becomes 62.

V-TINT (V-TNT)

1. Press " MENU " button on the Service remote control unit. Then select " V-TINT " (V-TNT) display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the value of " V-TINT " (V-TNT) becomes 59.

SHARP (SHARP)

1. Press " MENU " button on the Service remote control unit. Then select " SHARP " (SHARP) display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the value of " SHARP " (SHARP) becomes 47.

Note: BRIGHT data value does not need to be adjusted at this moment.

4. Black Level Adjustment

Purpose: Set Black Level

Symptom of Misadjustment: If black level is incorrect, Proper brightness can not be obtained by adjusting the Brightness Control.

1. Enter the Service mode. (See page 5-1).
2. Press " MENU " button on the Service remote control unit and select " BRT "mode. (Display changes " BRT ", " CNT ", " CLR ", " TNT ", " V-TNT ", and " SHARP " cyclically when MENU button is pressed).
3. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the value of " BRT " becomes 128.
4. Turn the power off and on again. (Main power button on the TV unit.)

5. V. Size Adjustment

Purpose: To obtain correct vertical width of screen image.

Symptom of Misadjustment: If V. Size is incorrect, vertical size of image on the screen may not be properly displayed.

Test Point	Adj. Point	Mode	Input
---	Screen Control CH ▲ / ▼ buttons [V-S] Mode	RF	Mono-scope
Tape	**M. EQ.**	**Spec.**	
---	Monoscope	90±5%	

Note: Use service remote control unit.

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode. (See page 5-1)
3. Receive the Monoscope Pattern.
4. Press " 9 " button on the Service remote control unit and select " V-S " mode. (Display changes " V-S " and " V-P " cyclically when " 9 " button is pressed).
5. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the monoscope pattern will be 90±5% of display size and the circle is round.
6. Turn the power off and on again. (Main power button on the TV unit.)

6. V. Position Adjustment

Purpose: To obtain correct vertical width of screen image.

Symptom of misadjustment: If V. Position is incorrect, vertical height of image on the screen may not be properly displayed.

Test Point	Adj. Point	Mode	Input
---	Screen Control CH ▲ / ▼ buttons [V-P] Mode	RF	Mono-scope
Tape	**M. EQ.**	**Spec.**	
---	Monoscope	90±5%	

Note: Use Service remote control unit

1. Operate the unit for at least 20 minutes.
2. Enter the Service Mode. (See page 5-1)
3. Receive the Monoscope Pattern.
4. Press " 9 " button on the Service remote control unit and select " V-P "mode. (Display change " V-S " and " V-P " cyclically when " 9 " button is pressed).
5. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the top and bottom of the monoscope pattern will be equal of each other.
6. Turn the Power off and on again. (Main power button on the TV unit.)

7. H. Position Adjustment

Purpose: To obtain correct horizontal position of screen image.

Symptom of Misadjustment: If H. Position is incorrect, horizontal position of image on the screen may not be properly displayed.

Test Point	Adj. Point	Mode	Input
---	Screen Control CH ▲ / ▼ buttons [H-P] Mode	RF	Mono-scope
Tape	**M. EQ.**	**Spec.**	
---	Monoscope	90±5%	

Note: Use Service remote control unit

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode. (See page 5-1)
3. Receive the Monoscope Pattern.
4. Press " 8 " button on the remote control unit and select " H-P "mode.
5. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the monoscope pattern will be 90±5% of display size and the circle is round.
6. Turn the Power off and on again. (Main power button on the TV unit.)

8. H. Size Adjustment

Purpose: To obtain correct horizontal size of screen image.

Symptom of Misadjustment: If H. Size is incorrect, horizontal size of image on the screen may not be properly displayed.

Test Point	Adj. Point	Mode	Input
---	VR562	RF	Mono-scope
Tape	**M. EQ.**	**Spec.**	
---	Monoscope	90±5%	

Note: Use Service remote control unit

1. Operate the unit for at least 20 minutes.
2. Receive the Monoscope Pattern.
3. Adjust VR562 so that the monoscope pattern will be 90±5% of display size and circle is round.
4. Turn the Power off and on again. (Main power button on the TV unit.)

9. PIN Cushion Adjustment

Purpose: To obtain correct straight vertical line of screen image.

Symptom of Misadjustment: If H.Pin cushion is incorrect, vertical line of image on the screen may not be properly displayed.

Test Point	Adj. Point	Mode	Input
---	VR561	RF	Cross hatch
Tape	**M. EQ.**	**Spec.**	
---	Cross hatch		

Note: Use Service remote control unit

1. Operate the unit for at least 20 minutes.
2. Receive the Cross hatch Pattern.
3. Adjust VR561 so that the cross hatch pattern will be straight line of display.
4. Turn the Power off and on again. (Main power button on the TV unit.)

10. Cut-off Adjustment

Purpose: To adjust the beam current of R, G, B, and screen voltage.

Symptom of Misadjustment: White color may be reddish, greenish or bluish.

Test Point	Adj. Point	Mode	Input
---	Screen-Control CH ▲ / ▼ buttons	RF	Black Raster
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See Reference Notes below.	

Figure

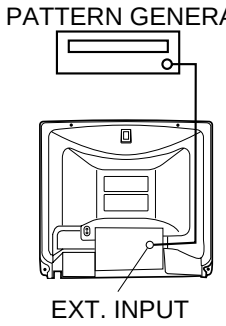


Fig. 2

Note: Screen Control FBT --- Main CBA
F.B.T= Fly Back Transformer
Use Service remote control unit

1. Degauss the CRT and allow CRT to operate for 20 minutes before starting the alignment.
2. Input the Black Raster Signal from RF Input.
3. Enter the Service mode. (See page 5-1)
4. Press " VOL ▼ " button on the Service remote control unit and select " C/D " mode. (Display changes " C/D ", " 7F ", " FRENCH ", " ACCESS CODE ", " STEREO ", " VIDEO TONE ", " FM-MODE ", and " V-OUT " cyclically when " VOL ▼ " button is pressed.) then press " 1 ". The display will momentarily show " CUT OFF R " (R= Red). Now there should be a horizontal line across the center of the picture tube. If needed gradually turn the screen control on the flyback, clockwise until the horizontal line appears. Adjust the Red Cut off by pressing the " CH ▲ / ▼ " buttons. Proceed to Step 5 when the Red Cut off adjustment is done.
5. Press the " 2 "button. The display will momentarily show " CUT OFF G " (G=Green). Adjust the Green Cut off by pressing the " CH ▲ / ▼ " buttons. Proceed to step 6 when the Green Cut off adjustment is done.
6. Press the " 3 " button. The display will momentarily show " CUT OFF B " (B=Blue). Adjust the Blue cut off by pressing the " CH ▲ / ▼ " buttons. When done with steps 4, 5 and 6 the horizontal line should be pure white if not, then attempt the Cut off adjustment again.

11. White Balance Adjustment

Purpose: To mix red, green and blue beams correctly for pure white.

Symptom of Misadjustment: White becomes bluish or reddish.

Test Point	Adj. Point	Mode	Input
Screen	CH ▲ / ▼ buttons	RF	White Raster (APL 100%)
Tape	**M. EQ.**	**Spec.**	
	Pattern Generator, Color analyzer	See below	
Figure			

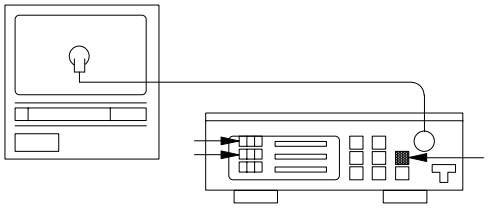


Fig. 3

Note: Use Service remote control unit

1. Operate the unit more than 20 minutes.
2. Face the unit to east. Degauss the CRT using Degaussing Coil.
3. Input the White Raster (APL 100%).
4. Set the color analyzer to the CHROMA mode and after zero point calibration, bring the optical receptor to the center on the tube surface (CRT).
5. Enter the Service mode. Press " VOL ▼ " button on the Service remote control unit and select " C/D " mode. (Display changes " C/D ", " 7F ", " FRENCH ", " ACCESS CODE ", " STEREO ", " VIDEO TONE ", " FM-MODE ", and " V-OUT " cyclically when " VOL ▼ " button is pressed.) then Press No. 8 button on the Service remote control Unit.
6. Press No. 4 button on the service remote control unit for Red adjustment. Press N0. 5 button on the Service remote control unit for Blue adjustment.
7. In each color mode, Press " CH ▲ / ▼ " button to adjust the values of color.
8. Adjusting Red and Blue color so that the temperature becomes 9200K (x : 286 / y : 294)±3%.
9. At this time, Re-check that Horizontal line is white. If not, Re-adjust Cut-off Adjustment until the Horizontal Line becomes pure white.
10. Turn off and on again to return to normal mode. Receive APL 100% white signal and Check Chroma temperatures become 9200K (x : 286 / y : 294)±3%.

Note: Confirm that Cut Off Adj. is correct after this adjustment, and attempt Cut Off Adj. if needed.

12. Sub-Brightness Adjustment

Purpose: To get proper brightness.

Symptom of Misadjustment: If Sub-Brightness is incorrect, proper brightness cannot be obtained by adjusting the Brightness Control.

Test Point	Adj. Point	Mode	Input
---	CH ▲ / ▼ buttons	RF	IQW
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below	
Figure			

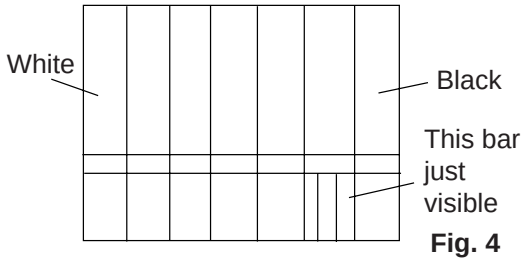


Fig. 4

Note: IQW Setup level --- 7.5 IRE
Use Service remote control unit

1. Enter the Service mode. (See page 5-1) Then input IQW signal from RF Input.
2. Press " MENU " button on the Service remote control unit and Select " BRT " mode. (Display changes " BRT ", " CNT ", " CLR ", " TNT ", " V-TNT ", and " SHARP " cyclically when MENU button is pressed). Press " CH ▲ / ▼ " buttons so that the bar is just visible (See above figure).
3. Turn the power off and on again. (Main power button on the TV unit.)

13. Focus Adjustment

Purpose: Set the optimum Focus.

Symptom of Misadjustment: If Focus Adjustment is incorrect, blurred images are shown on the display.

Test Point	Adj. Point	Mode	Input
---	Focus Control	---	Mono-scope
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below	

Note: Focus VR (FBT) - Main CBA FBT=Fly Back Transformer

1. Operate the unit more than 30 minutes
2. Face the unit to the East and Degauss the CRT using Degaussing Coil.
3. Input the Monoscope Pattern.
4. Adjust the Focus Control on the FBT to obtain clear picture.

The following 2 adjustments normally are not attempted in the field. Only when replacing the CRT then adjust as a preparation.

14. Purity Adjustment

Purpose: To obtain pure color.

Symptom of Misadjustment: If Color Purity Adjustment is incorrect, large areas of color may not be properly displayed.

Test Point	Adj. Point	Mode	Input
---	Deflection Yoke Purity Magnet	---	Red Color
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below.	

Figure

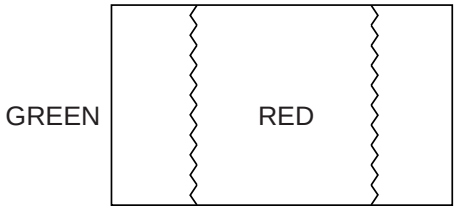


Fig. 5

1. Set the unit facing east.
2. Operate the unit for over 30 minutes before adjusting.
3. Fully degauss the unit using an external degaussing coil.
4. Loosen the screw on the Deflection Yoke Clamper and pull the Deflection Yoke back away from the screen. (See Fig. 6)
5. Loosen the Ring Lock and adjust the Purity Magnets so that a red field is obtained at the center of the screen. Tighten Ring Lock. (See Fig. 5,6)
6. Slowly push the Deflection Yoke toward bell of CRT and set it where a uniform red field is obtained.
7. Tighten the clamp screw on the Deflection Yoke.

15. Convergence Adjustment

Purpose: To obtain proper convergence of red, green and blue beams.

Symptom of Misadjustment: If Convergence Adjustment is incorrect, the edge of white letters may have color edges.

Test Point	Adj. Point	Mode	Input
---	C.P. Magnet (RB), C.P. Magnet (RB-G), Deflection Yoke	---	Dot Pattern or Crosshatch
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below.	

Figures

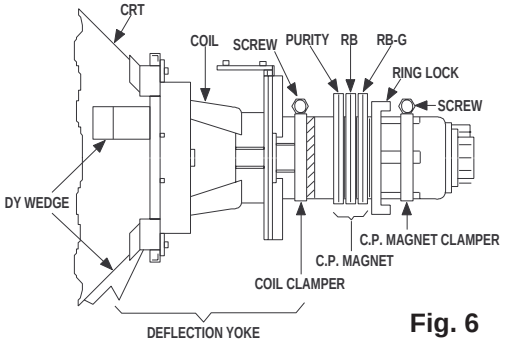


Fig. 6

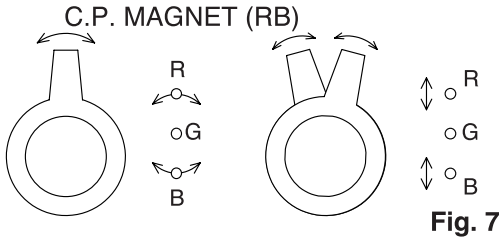


Fig. 7

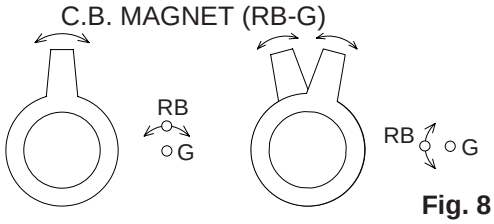
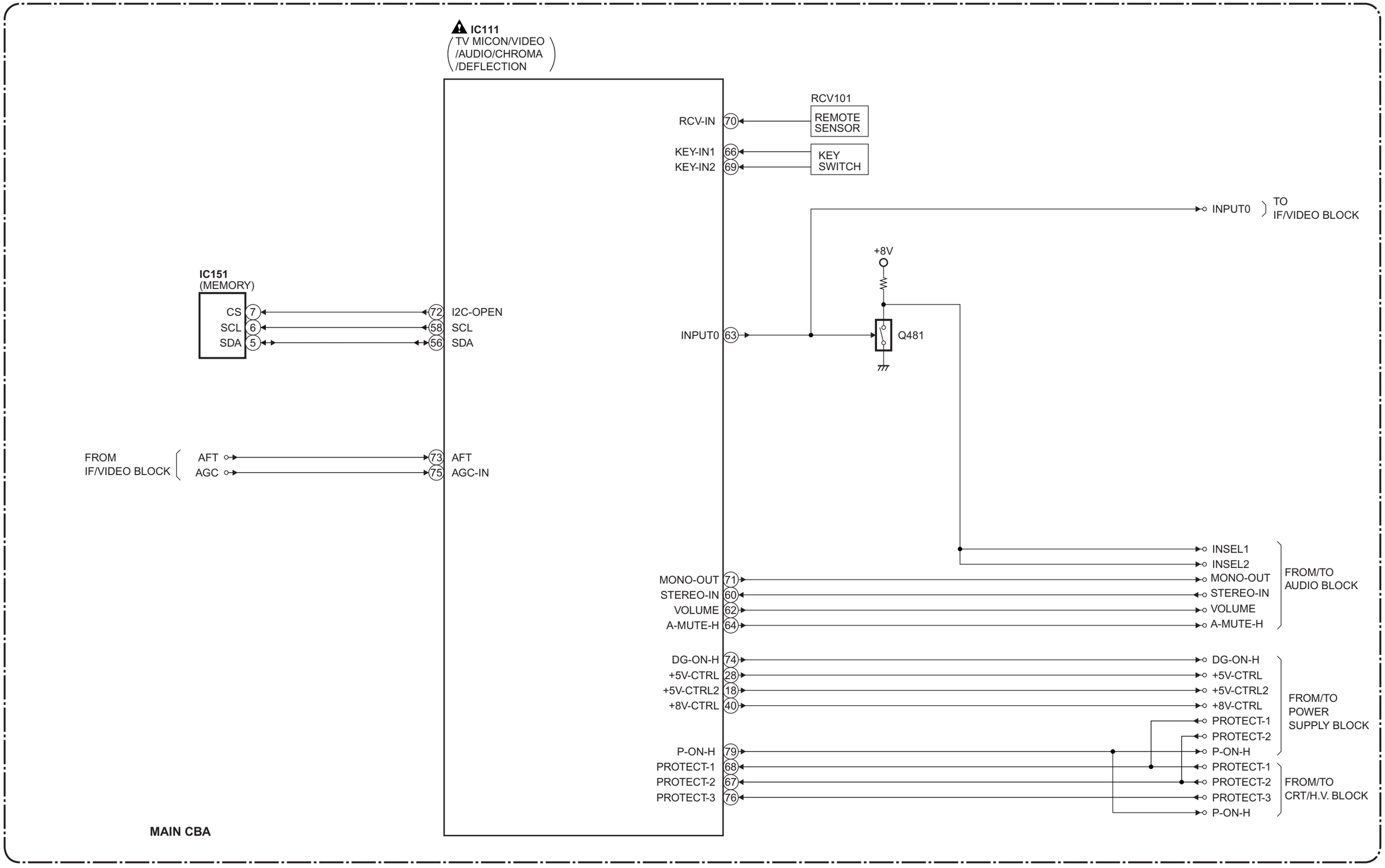


Fig. 8

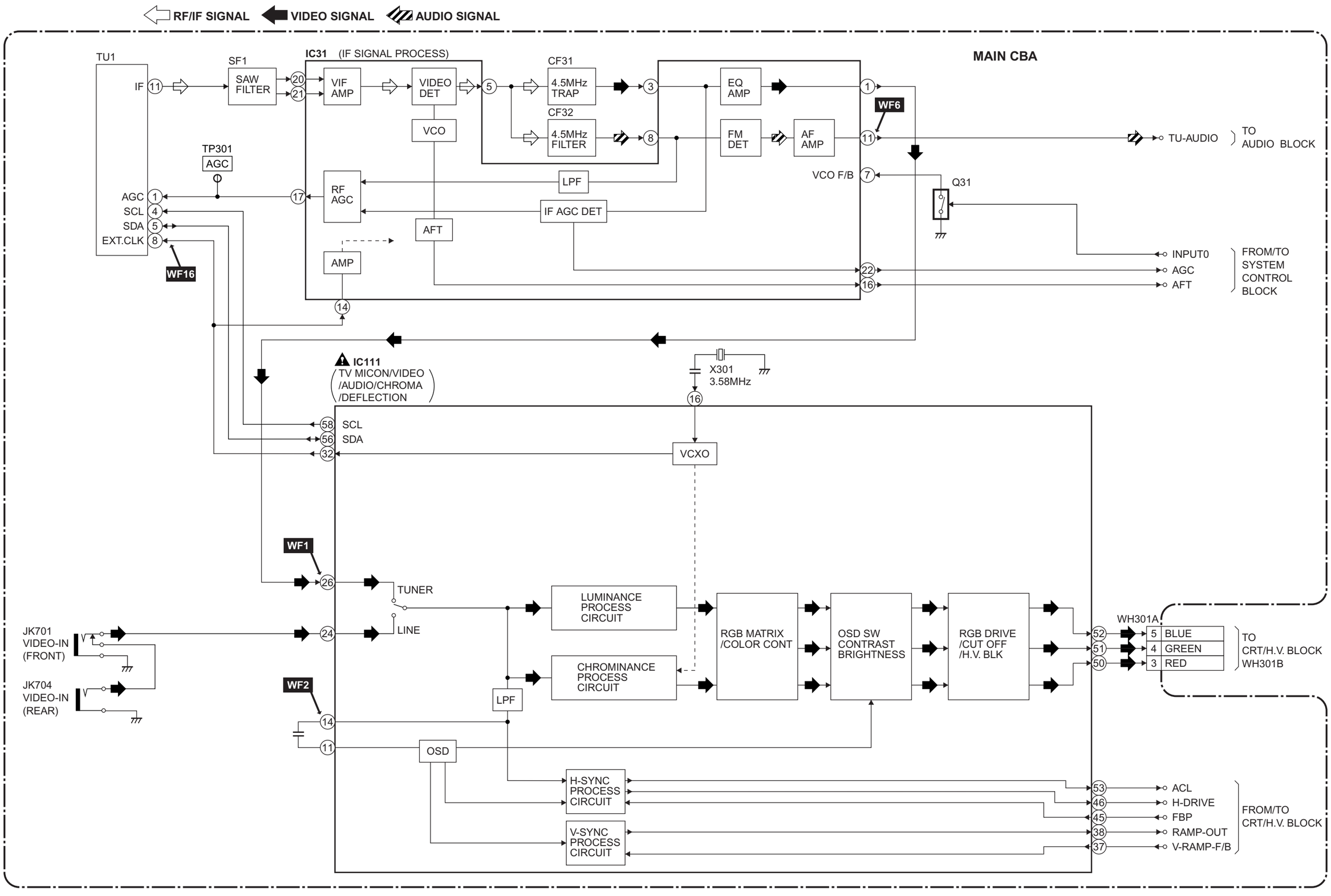
1. Loosen the Ring Lock and align red with blue dots or Crosshatch at the center of the screen by rotating (RB) C.P. Magnets. (See Fig. 7)
2. Align red / blue with green dots at the center of the screen by rotating (RB-G) C.P. Magnet. (See Fig. 8)
3. Fix the C.P. Magnets by tightening the Ring Lock.
4. Remove the DY Wedges and slightly tilt the Deflection Yoke horizontally and vertically to obtain the best overall convergence.
5. Fix the Deflection Yoke by carefully inserting the DY Wedges between CRT and Deflection Yoke.

BLOCK DIAGRAMS

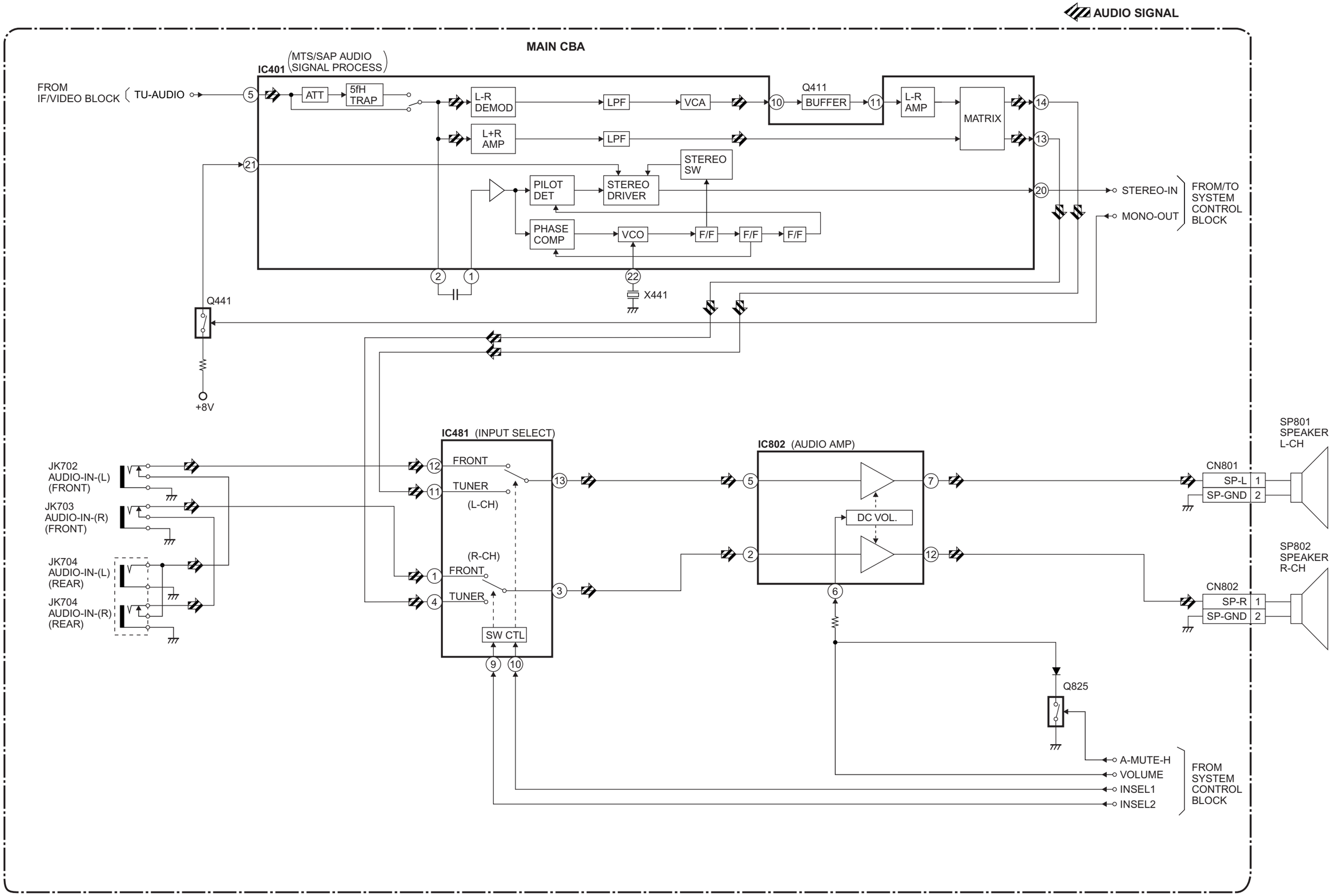
System Control Block Diagram



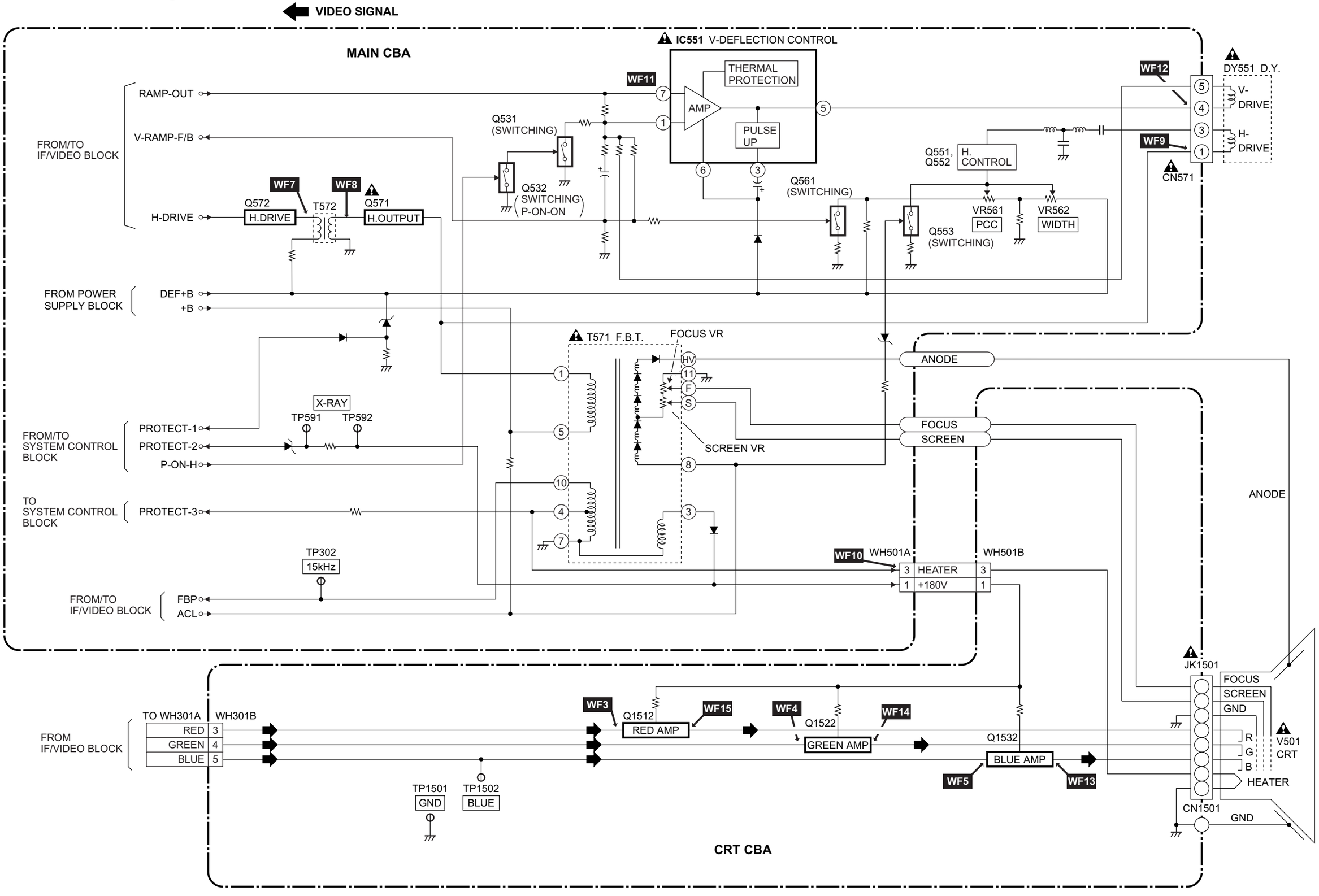
IF/Video Block Diagram



Audio Block Diagram



CRT/H.V. Block Diagram



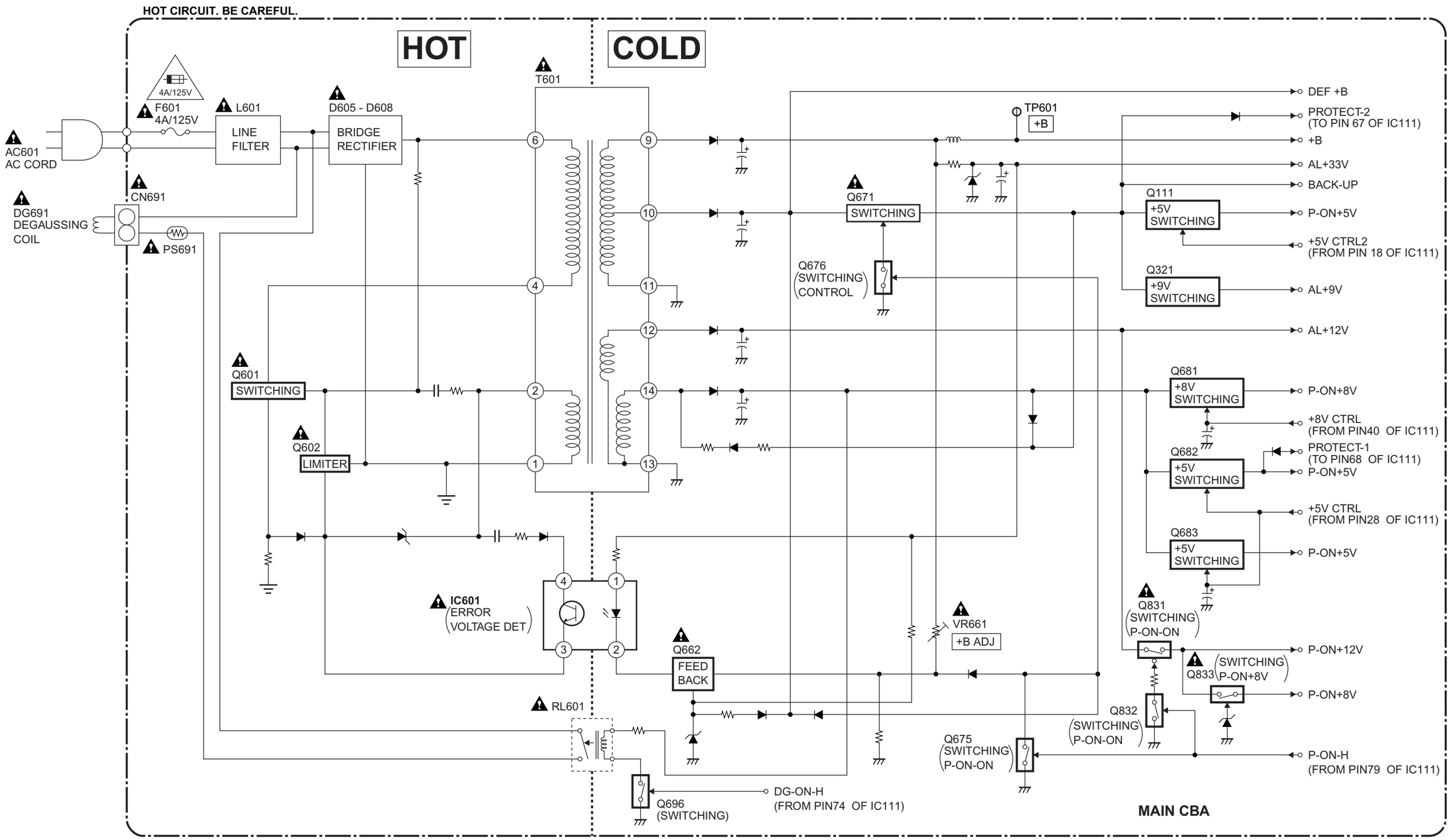
Power Supply Block Diagram

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F601) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

4A/125V

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 4 A, 125V FUSE.
ATTENTION: UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE DE 4A, 125V.

NOTE :
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



SCHEMATIC DIAGRAMS / CBA'S AND TEST POINTS

Standard Notes

Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the mark " ⚠ " in the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

Note:

1. Do not use the part number shown on these drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since these drawings were prepared.
2. All resistance values are indicated in ohms ($K=10^3$, $M=10^6$).
3. Resistor wattages are 1/4W or 1/6W unless otherwise specified.
4. All capacitance values are indicated in µF ($P=10^{-6}$µF).
5. All voltages are DC voltages unless otherwise specified.

Note of Capacitors:

ML --- Mylar Cap. PP --- Metallized Film Cap. SC --- Semiconductor Cap. L --- Low Leakage type

Temperature Characteristics of Capacitors are noted with the following:

B --- ±10% CH --- 0±60ppm/°C CSL --- +350~-1000ppm/°C

Tolerance of Capacitors are noted with the following:

Z --- +80~-20%

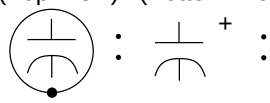
Note of Resistors:

CEM --- Cement Res. MTL --- Metal Res. F --- Fuse Res.

Capacitors and transistors are represented by the following symbols.

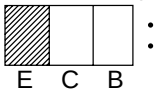
CBA Symbols

(Top View) (Bottom View)



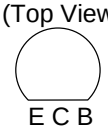
Electrolytic Capacitor

(Bottom View)



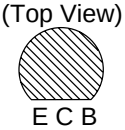
Transistor or Digital Transistor

(Top View)



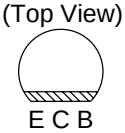
NPN Transistor

(Top View)



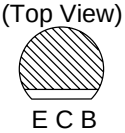
PNP Transistor

(Top View)



NPN Digital Transistor

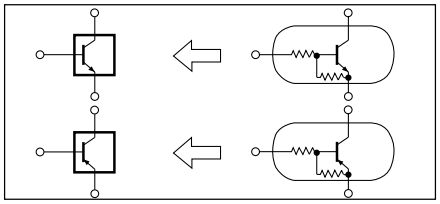
(Top View)



PNP Digital Transistor

Schematic Diagram Symbols

Digital Transistor



LIST OF CAUTION, NOTES, AND SYMBOLS USED IN THE SCHEMATIC DIAGRAMS ON THE FOLLOWING PAGES:

1. CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE_A,_V FUSE.
ATTENTION: UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE DE_A,_V.

2. **CAUTION:**

Fixed Voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F601) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

3. **Note:**

(1) Do not use the part number shown on the drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since the drawings were prepared.

(2) To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

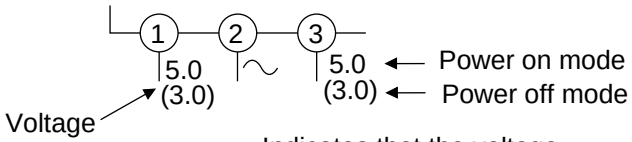
4. **Wire Connectors**

(1) Prefix symbol "CN" means "connector" (can disconnect and reconnect).

(2) Prefix symbol "CL" means "wire-solder holes of the PCB" (wire is soldered directly).

5. **Note:** Mark "●" is a leadless (chip) component.

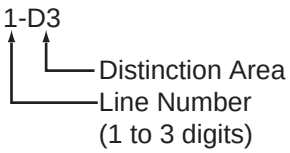
6. **Voltage indications on the schematics are as shown below:**
Plug the TV power cord into a standard AC outlet.:



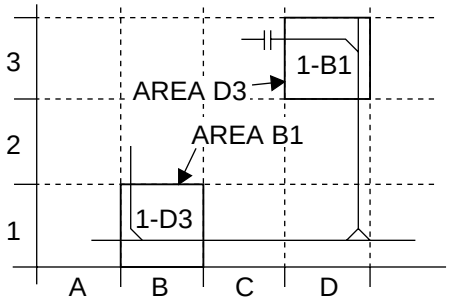
Indicates that the voltage is not consistent here.

Unit: Volts

7. **How to read converged lines**



Examples:
1. "1-D3" means that line number "1" goes to area "D3".
2. "1-B1" means that line number "1" goes to area "B1".



8. **Test Point Information**

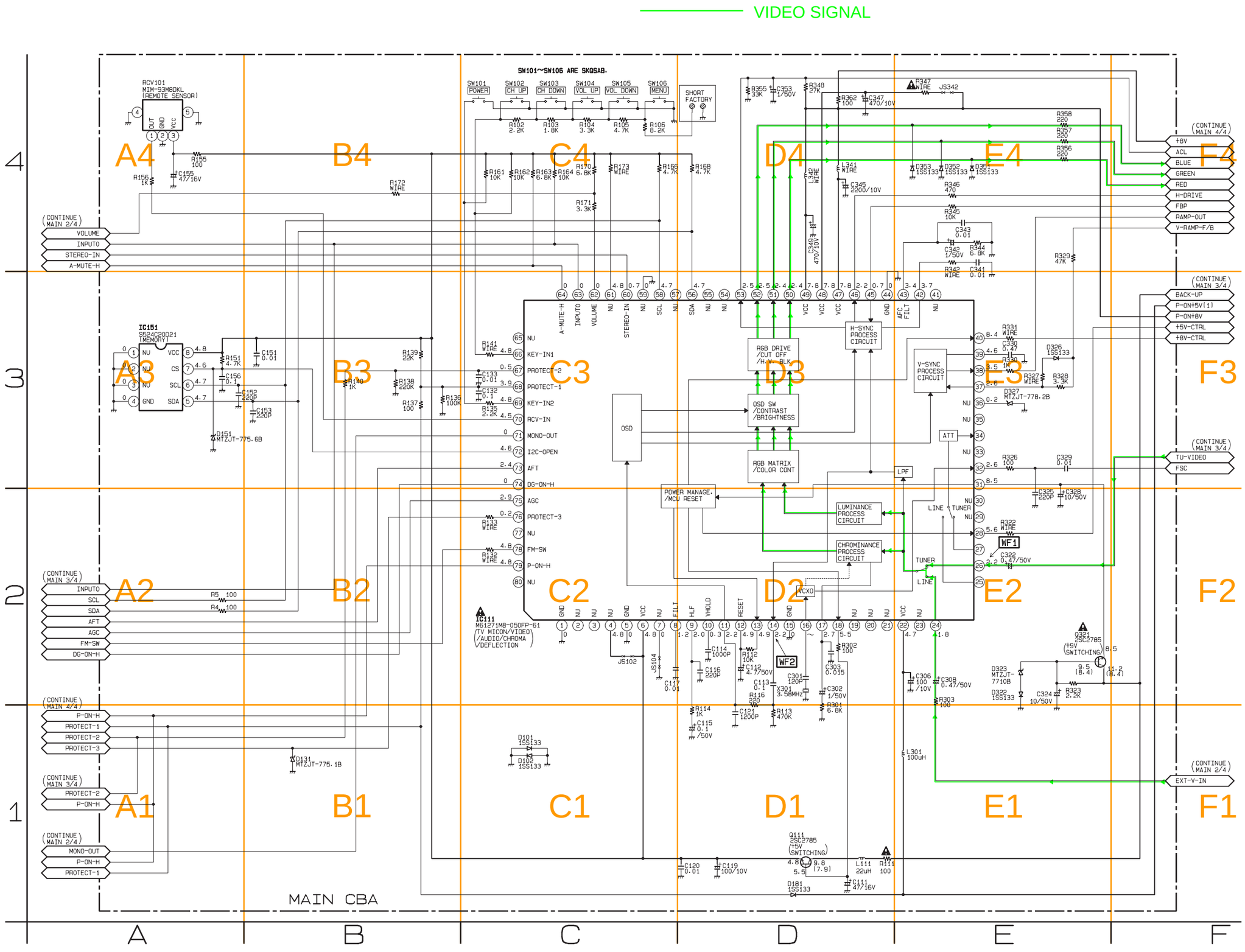
: Indicates a test point with a jumper wire across a hole in the PCB.

: Used to indicate a test point with a component lead on foil side.

: Used to indicate a test point with no test pin.

: Used to indicate a test point with a test pin.

Main 1/4 Schematic Diagram



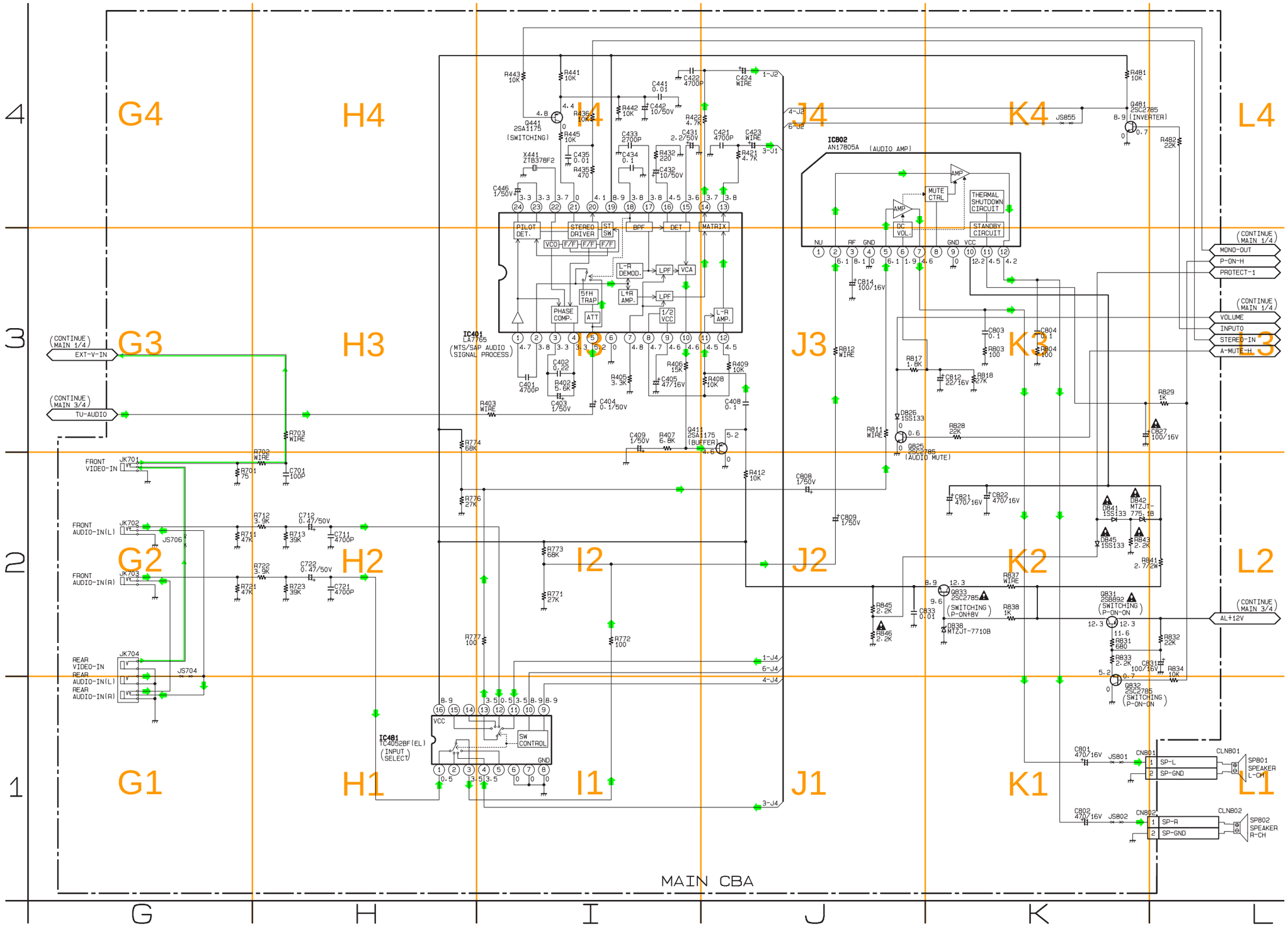
MAIN 1/4

Ref No.	Position
ICS	
IC111	C-2
IC151	A-3
TRANSISTORS	
Q111	D-1
Q321	E-2

Main 2/4 Schematic Diagram

VIDEO SIGNAL

AUDIO SIGNAL



MAIN 2/4

Ref No.	Position
ICS	
IC401	H-3
IC481	H-1
IC802	J-4
TRANSISTORS	
Q411	I-3
Q441	I-4
Q481	K-4
Q825	J-3
Q831	K-2
Q832	K-1
Q833	K-2
CONNECTORS	
CN801	K-1
CN802	K-1

Main 3/4 Schematic Diagram

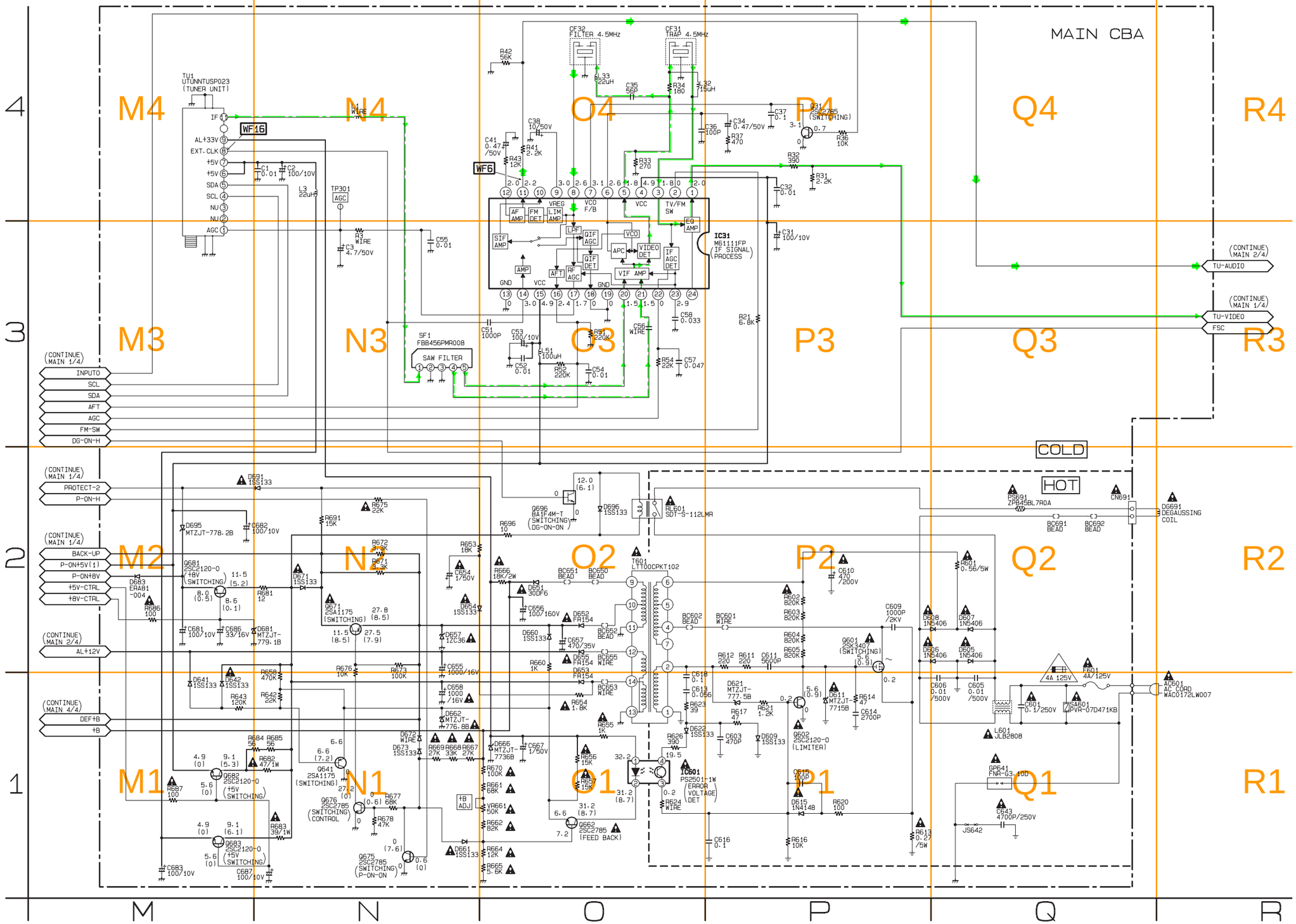
IF SIGNAL
VIDEO SIGNAL
AUDIO SIGNAL

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F601) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

NOTE :
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

4A/125V

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 4A, 125V FUSE.
ATTENTION: UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE DE 4A, 125V.



MAIN 3/4

Ref No.	Position
ICS	
IC31	P-3
IC601	O-1
TRANSISTORS	
Q31	P-4
Q601	P-2
Q602	P-1
Q641	N-1
Q662	O-1
Q671	N-2
Q675	N-1
Q676	N-1
Q681	M-1
Q682	M-1
Q683	M-1
Q696	O-2
CONNECTOR	
CN691	Q-2
TEST POINT	
TP301	N-4
VARIABLE RESISTOR	
VR661	O-1

Main 4/4 & CRT Schematic Diagram

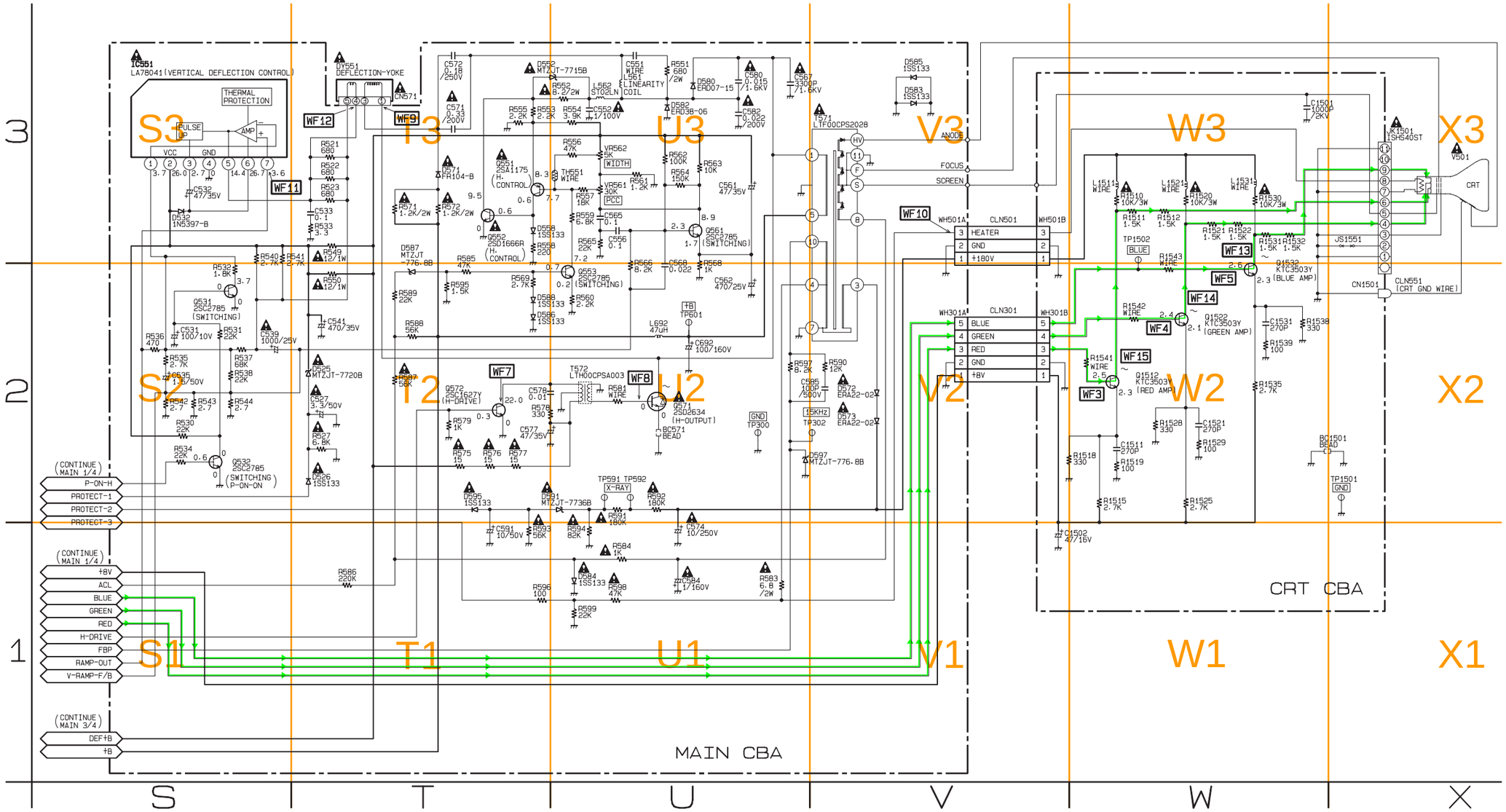
MAIN 4/4

Ref No.	Position	Ref No.	Position	Ref No.	Position
IC		TRANSISTORS		TEST POINTS	
IC551	S-3	Q572	T-2	TP592	U-2
TRANSISTORS		CONNECTORS		TP601	U-2
Q531	S-2	CN571	T-3	VARIABLE RESISTORS	
Q532	S-2	WH301A	V-2	VR561	U-3
Q551	T-3	WH501A	V-3	VR562	U-3
Q552	T-3	TEST POINTS			
Q553	U-2	TP300	U-2		
Q561	U-3	TP302	V-2		
Q571	U-2	TP591	U-2		

CRT

Ref No.	Position
TRANSISTORS	
Q1512	W-2
Q1522	W-2
Q1532	W-2
CONNECTORS	
CN1501	X-2
WH301B	V-2
WH501B	V-3
TEST POINTS	
TP1501	X-2
TP1502	W-3

VIDEO SIGNAL



Main CBA Top View

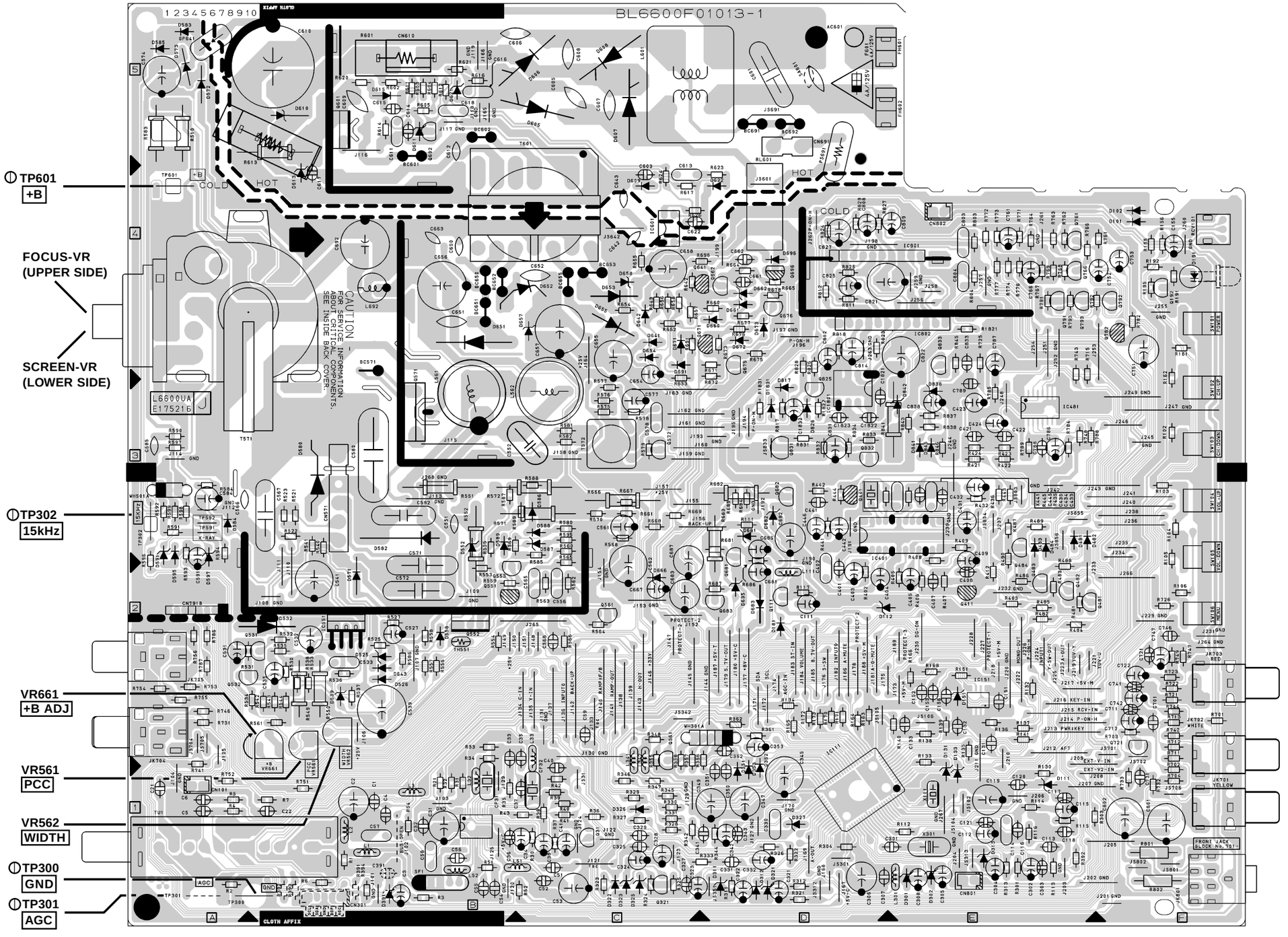
CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F601) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

4A/125V

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 4A, 125V FUSE.
ATTENTION: UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE DE 4A, 125V.

NOTE :
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

BECAUSE A HOT CHASSIS GROUND IS PRESENT IN THE POWER SUPPLY CIRCUIT, AN ISOLATION TRANSFORMER MUST BE USED. ALSO, IN ORDER TO HAVE THE ABILITY TO INCREASE THE INPUT SLOWLY, WHEN TROUBLESHOOTING THIS TYPE POWER SUPPLY CIRCUIT, A VARIABLE ISOLATION TRANSFORMER IS REQUIRED.



MAIN CBA

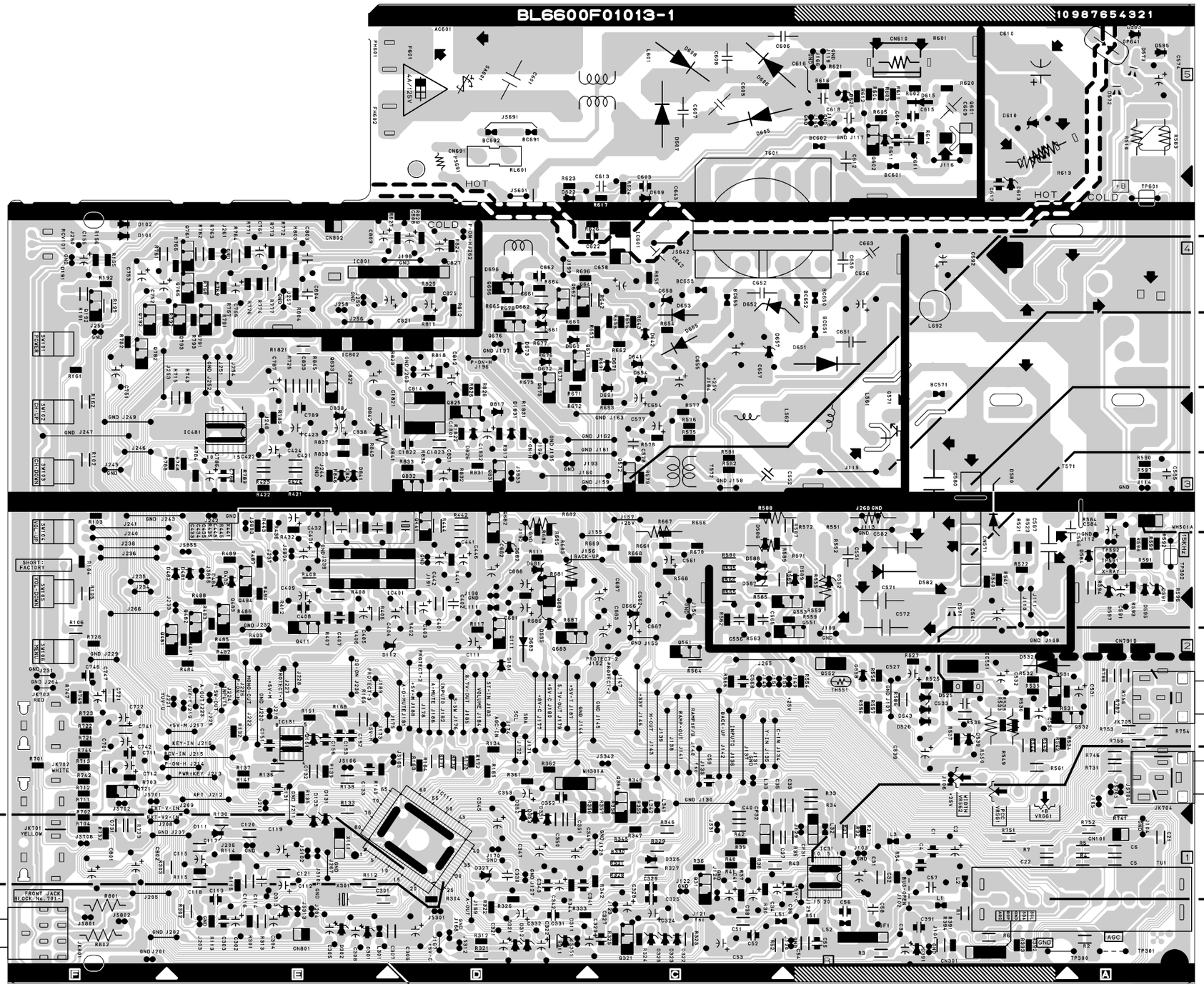
Ref No.	Position
ICS	
IC31	B-1
IC111	D-2
IC151	E-2
IC401	D-3
IC481	E-3
IC551	B-2
IC601	C-4
IC802	E-4
TRANSISTORS	
Q31	C-1
Q111	D-2
Q321	C-1
Q411	E-2
Q441	D-3
Q481	F-2
Q531	B-2
Q532	A-2
Q551	B-2
Q552	B-2
Q553	B-2
Q561	C-2
Q571	B-4
Q572	C-3
Q601	B-5
Q602	B-5
Q641	D-4
Q662	D-4
Q671	D-4
Q675	D-4
Q676	D-4
Q681	D-2
Q682	D-3
Q683	D-2
Q696	D-4
Q825	D-4
Q831	D-3
Q832	D-3
Q833	E-4
CONNECTORS	
CN571	B-3
CN691	D-5
CN801	E-1
CN802	E-4
WH301A	C-2
WH501A	A-3
TEST POINTS	
TP300	A-1
TP301	A-1
TP302	A-3
TP591	A-3
TP592	A-3
TP601	A-4
VARIABLE RESISTORS	
VR561	B-2
VR562	B-2
VR661	B-2

Main CBA Bottom View

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F601) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 4A, 125V FUSE.
ATTENTION: UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE DE 4A, 125V.
NOTE :
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

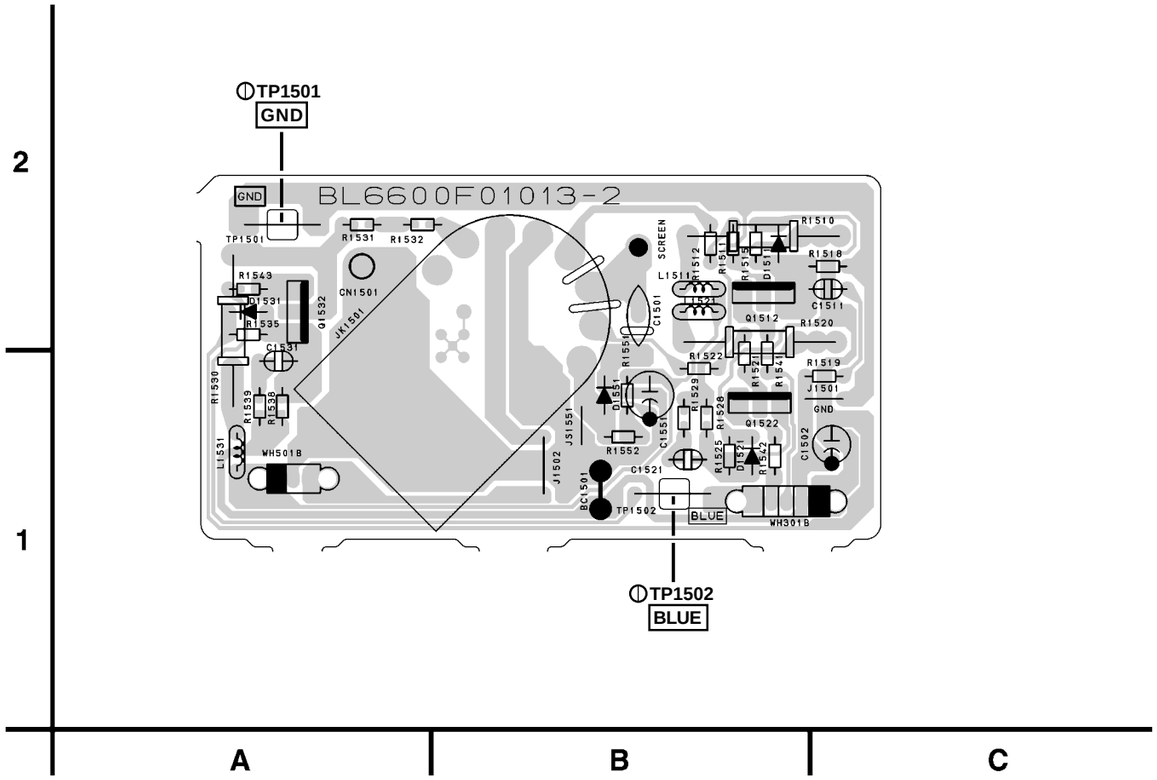
BECAUSE A HOT CHASSIS GROUND IS PRESENT IN THE POWER SUPPLY CIRCUIT, AN ISOLATION TRANSFORMER MUST BE USED. ALSO, IN ORDER TO HAVE THE ABILITY TO INCREASE THE INPUT SLOWLY, WHEN TROUBLESHOOTING THIS TYPE POWER SUPPLY CIRCUIT, A VARIABLE ISOLATION TRANSFORMER IS REQUIRED.



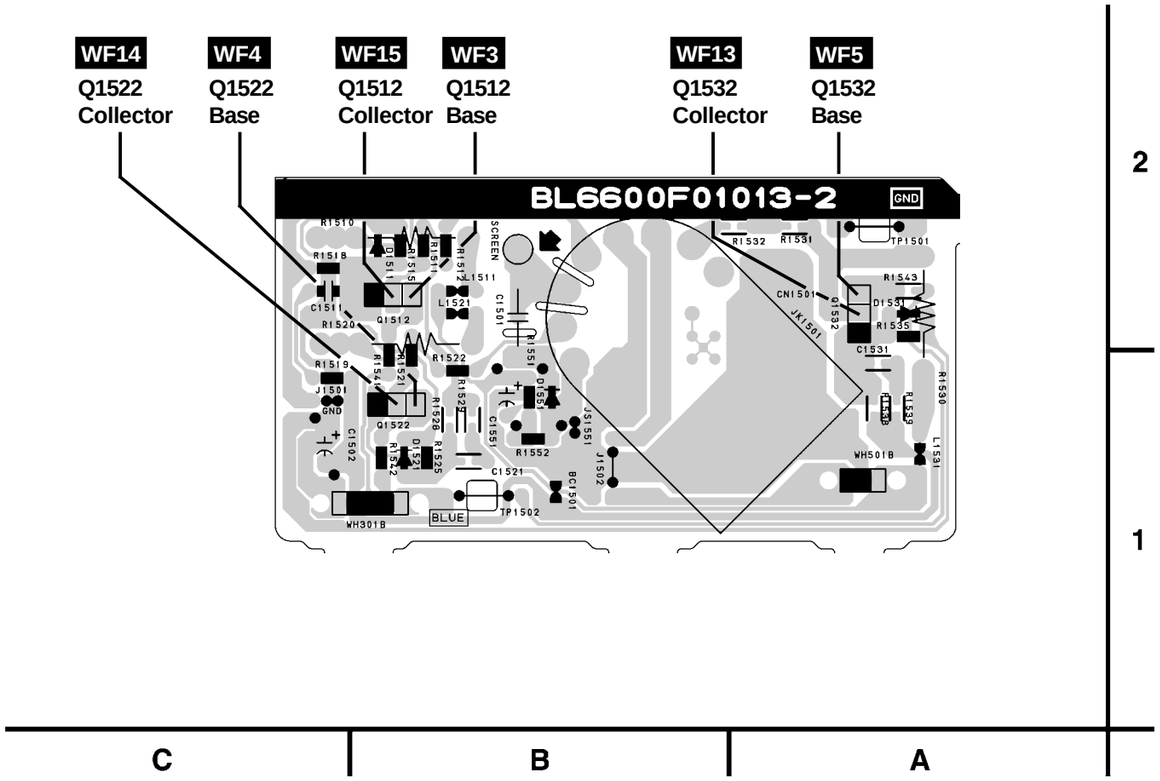
CRT CBA Top View

CRT CBA

Ref No.	Position
TRANSISTORS	
Q1512	B-2
Q1522	B-1
Q1532	A-2
CONNECTORS	
CN1501	A-2
WH301B	B-1
WH501B	A-1
TEST POINTS	
TP1501	A-2
TP1502	B-1



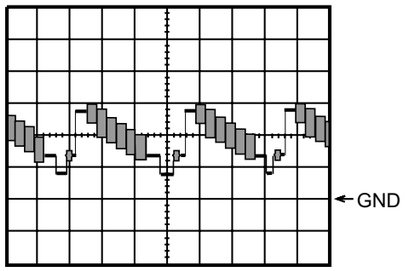
CRT CBA Bottom View



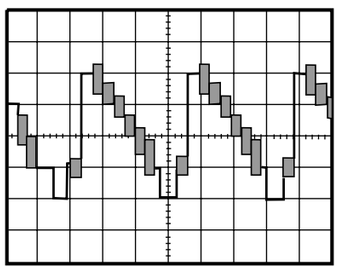
WAVEFORMS

WF1 ~ WF16 = Waveforms to be observed at Waveform check points. (Shown in Schematic Diagram.)

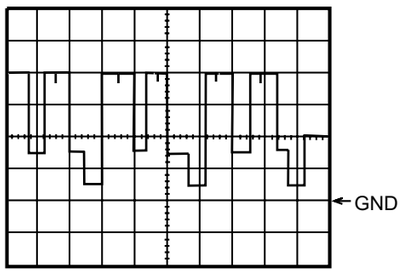
Input: NTSC Color Bar Signal (with 1kHz Audio Signal)
INITIAL POSITION: Unplug unit from AC outlet for at least 5 minutes. reconnect to AC outlet and then turn power on.
(Brightness---Center Color---Center Tint --- Center Contrast---Approx 70%)



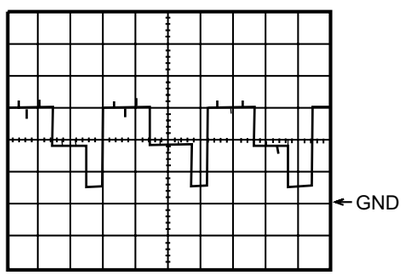
WF1 1DIV: 0.5V 20µsec
IC 111 Pin 26



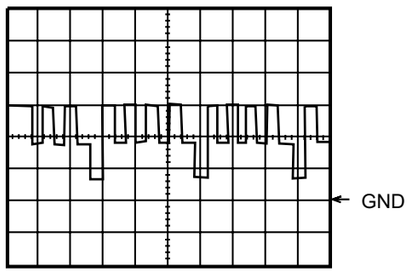
WF2 1DIV: 0.5V 20µsec
IC 111 Pin 14



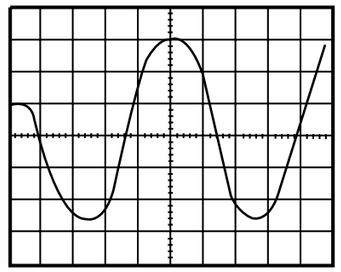
WF3 1DIV: 2V 20µsec
Q1512 Base



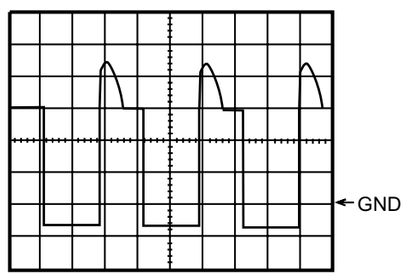
WF4 1DIV: 2V 20µsec
Q 1522 Base



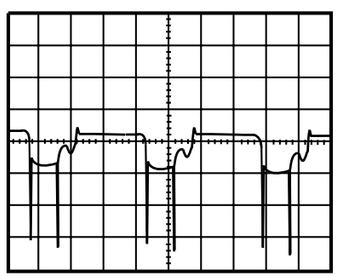
WF5 1DIV: 2V 20µsec
Q 1532 Base



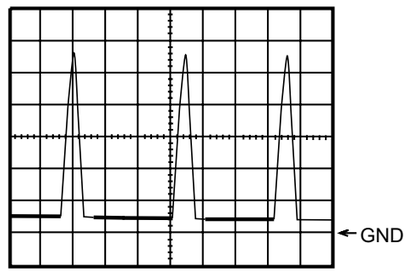
WF6 1DIV: 0.2V 20msec
IC 31 Pin 11



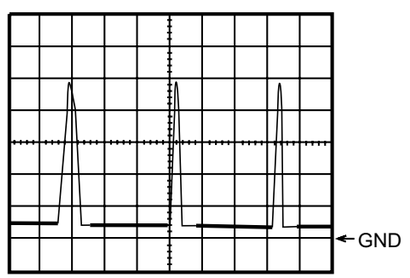
WF7 1DIV: 10V 20µsec
Q 572 Collector



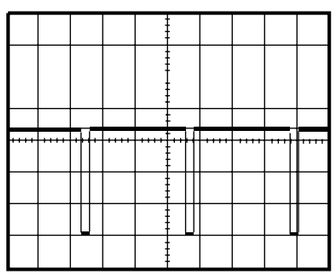
WF8 1DIV: 5V 20µsec
Q 571 Base



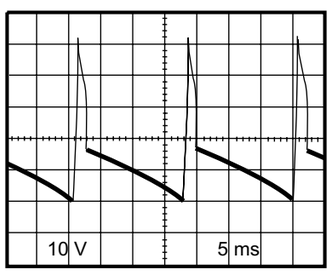
WF9 1DIV: 200V 20µsec
CN 571 Pin 1



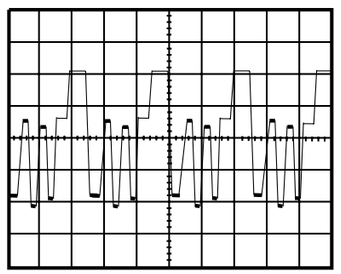
WF10 1DIV: 5V 20µsec
WH501A Pin 3



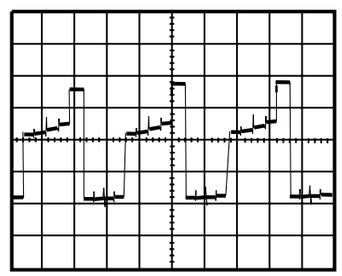
WF11 1DIV: 2V 5msec
IC 551 Pin 7



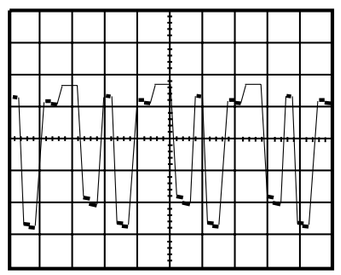
WF12 1DIV: 10V 5msec
CN 571 Pin 4



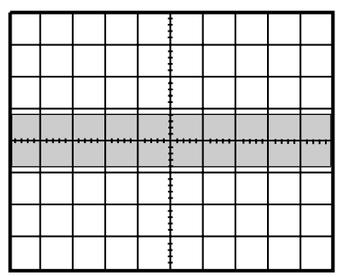
WF13 1DIV: 20V 20µsec
Q1532 Collector



WF14 1DIV: 20V 20µsec
Q 1522 Collector

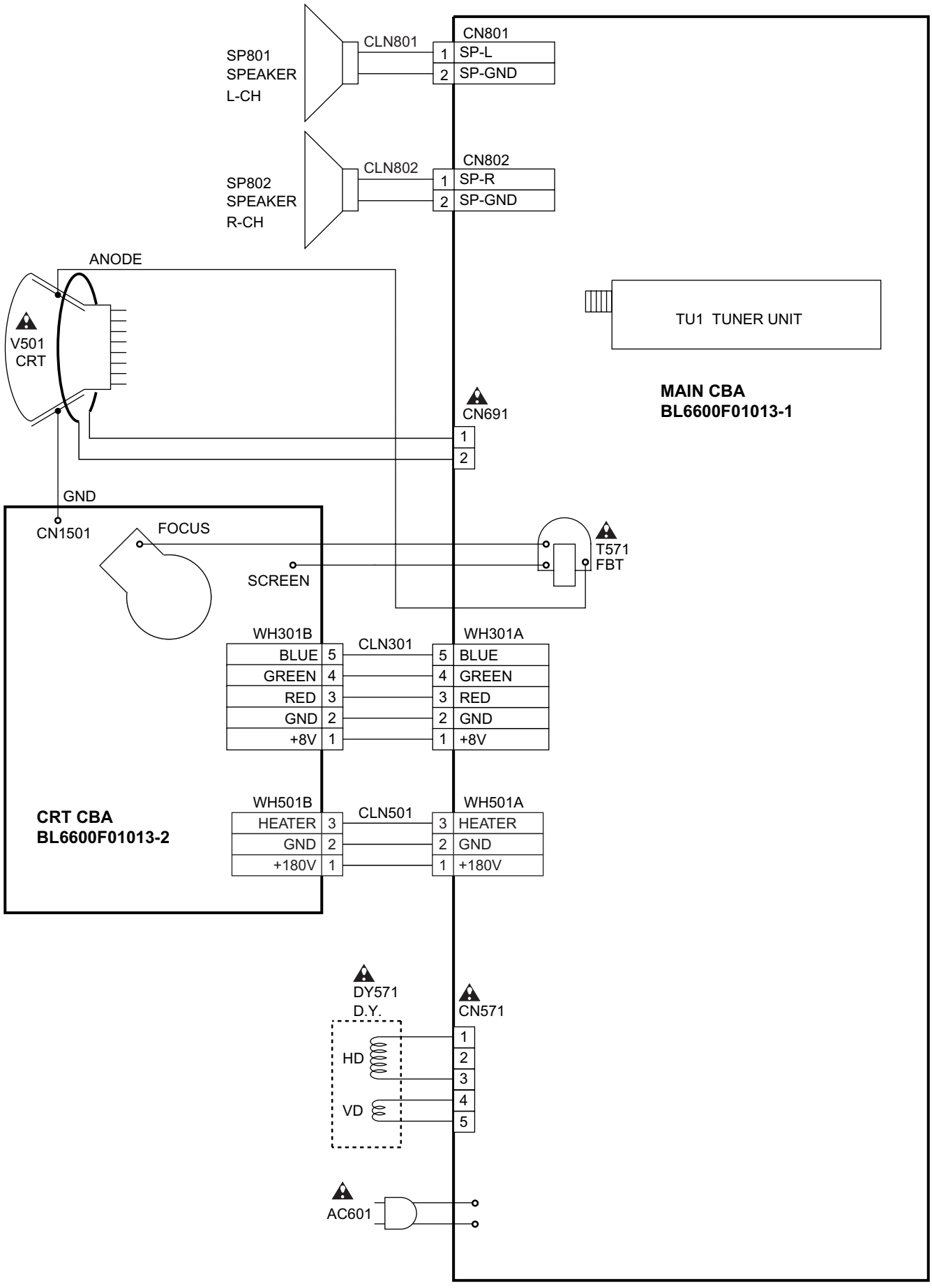


WF15 1DIV: 20V 20µsec
Q 1512 Collector



WF16 1DIV: 0.2V 20µsec
TU 1 Pin 8

WIRING DIAGRAM



IC PIN FUNCTIONS

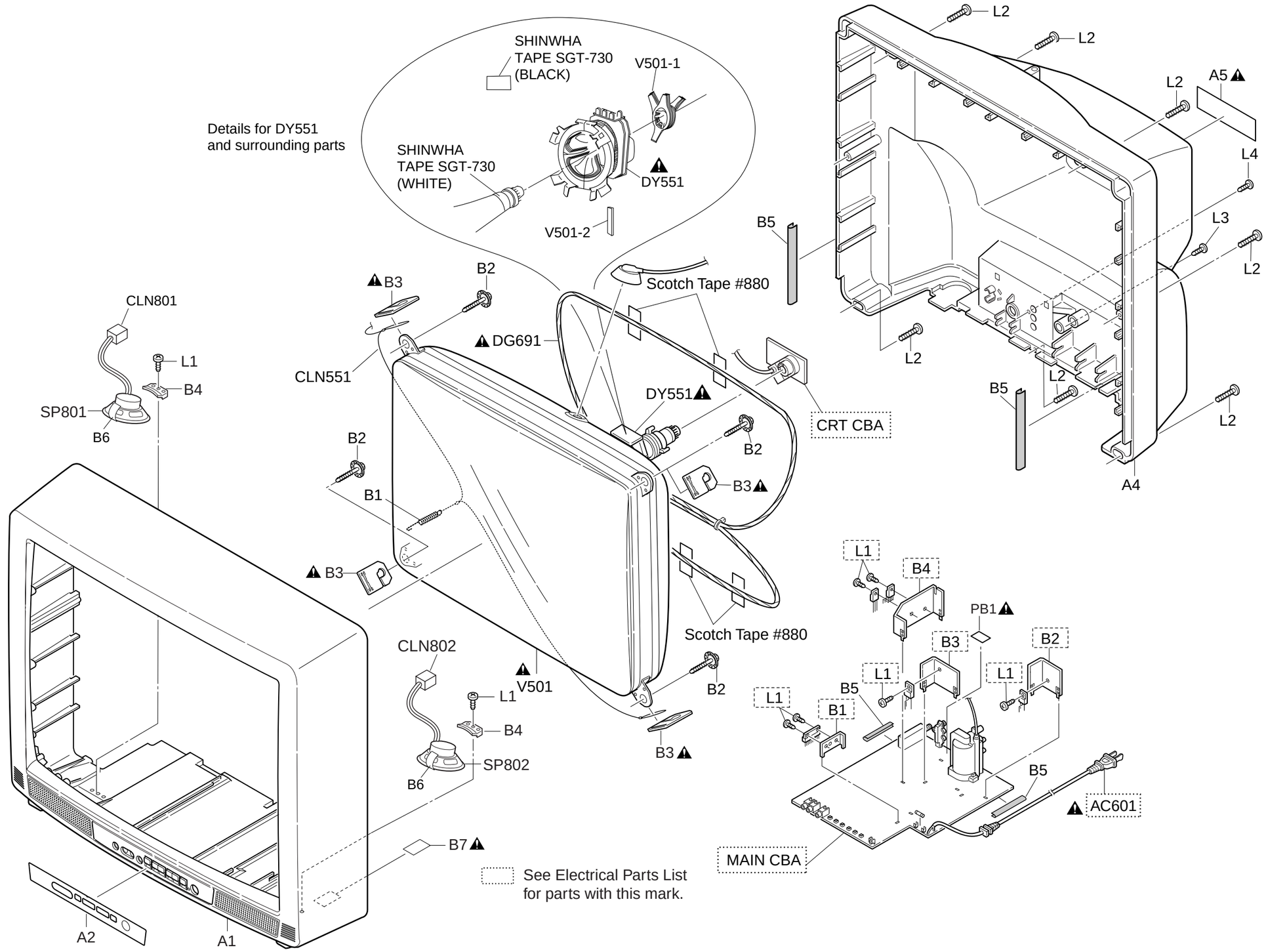
IC111(TV Micro Computer)

Pin No.	Signal Name	Function
1	GND	GND
2	N.U.	Not Used
3	N.U.	Not Used
4	N.U.	Not Used
5	GND	GND
6	VCC	AL+5V
7	N.U.	Not Used
8	FILT	FILT
9	HLF	Filter for CCD
10	VHOLD	VHOLD
11	CVIN	Input for Video Signal
12	RESET	RESET
13	MCU RESET OUT	RESET Signal Output
14	Y-SW OUT	Composite Signal Output
15	GND	GND
16	3.58 X'TAL	3.58MHz Crystal
17	C-APC	CHROMINANCE APC
18	MCU 5.7REG OUT	Micro controller Control Voltage Output
19	N.U.	Not Used
20	N.U.	Not Used
21	N.U.	Not Used
22	VCC	VCC
23	N.U.	(GND)
24	CVBS IN2	Composite Signal Input 2
25	N.U.	Not Used
26	CVBS IN1	Composite Signal Input 1
27	N.U.	Not Used
28	5.7V REG OUT	5.7V Output
29	N.U.	Not Used
30	N.U.	Not Used
31	V REG VCC	DC 8.7V Input
32	FSC OUT	Clock Output 3.58MHz
33	N.U.	Not Used
34	N.U.	Not Used
35	N.U.	Not Used
36	N.U.	Not Used
37	V RAMP F/B	V Ramp Feed Back
38	V RAMP OUT	Vertical Output
39	V RAMP CAP	V Ramp OSC Capacitor
40	8.7 VREG OUT	DC 8.7V Output
41	N.U.	Not Used
42	H VCO F/B	H Vco Feed Back
43	AFC FILT	Horizontal AFC Filter
44	GND	GND
45	FBP IN	Flyback Pulse Input
46	H-OUT	H Pulse Output
47	VCC	Vcc
48	VCC	Vcc
49	VCC	Vcc
50	R OUT	Red Output
51	G OUT	Green Output
52	B OUT	Blue Output
53	ACL	IB-Input
54	N.U.	Not Used
55	N.U.	Not Used
56	SDA	I2C-BUS Controller Interface (Data)
57	N.U.	Not Used
58	SCL	I2C-BUS Controller Interface (Clock)
59	N.U.	(GND)
60	STEREO-IN	STEREO-IN
61	N.U.	Not Used
62	VOLUME	Volume
63	INPUTO	EXT-H
64	A-MUTE-H	Audio Mute
65	N.U.	Not Used
66	KEY-IN 1	Key Input 1 (Main)
67	PROTECT-2	Power Supply Protection
68	PROTECT-1	Power Supply Protection
69	KEY-IN 2	Key Input 2 (Main)
70	RCV-IN	Input For Remote Control

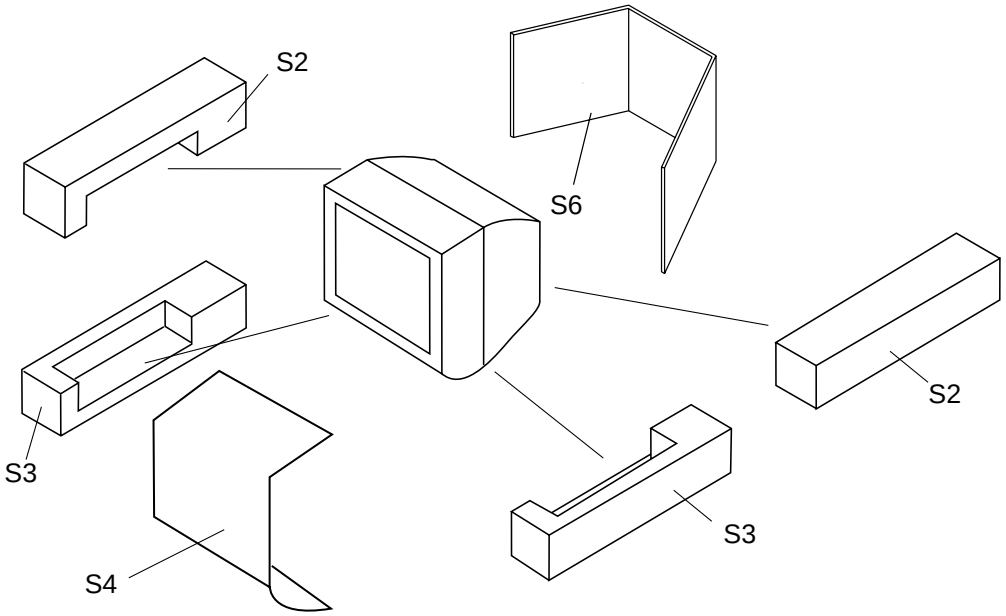
Pin No.	Signal Name	Function
71	MONO-OUT	MONO-OUT
72	I2C OPEN	White Balance Adjustment Judgement
73	AFT	AFT Voltage Input
74	DG-ON-H	Degaussing Coil Control
75	AGC	AGC Voltage Input
76	PROTECT 3	Power Supply Protection
77	N.U.	Not Used
78	FM-SW	Switching IF IC VCO
79	P-ON-H	Output for P-ON-H
80	N.U.	Not Used

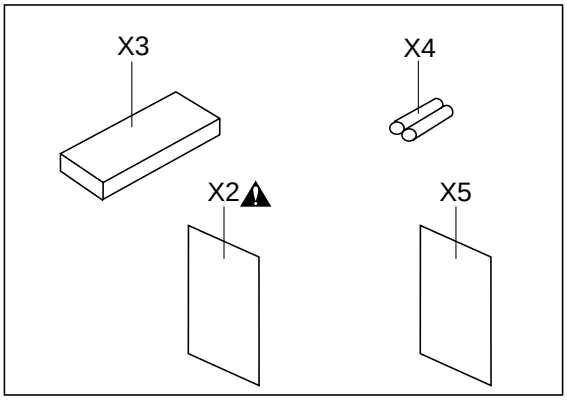
EXPLODED VIEWS

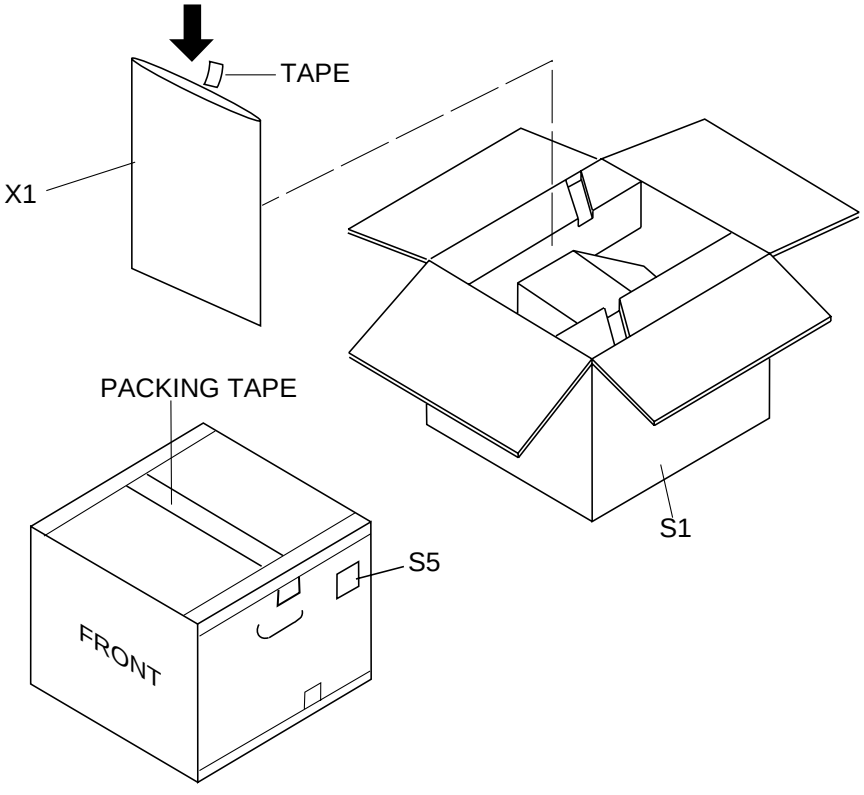
Cabinet



Packing







MECHANICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

NOTE:
Parts that are not assigned part numbers (---------) are not available.

Ref. No.	Description	Part No.
A1	FRONT CABINET L6203UD	0EM000662
A2	CONTROL PLATE L6203UD	0EM301695
A4	REAR CABINET L6609UK	0EM101351
A5⚠	RATING LABEL L6609UK	---------
B1	TENSION SPRING B0080B0:EM40808	26WH006
B2	M7 CRT SCREW(D22) T7205UF	0EM406573
B3⚠	DEGAUSS HOLDER L1200UA	0EM405869
B4	SPEAKER HOLDER L1200UA	0EM405691
B5	CLOTH L9800UA:95X15XT:0.5	0EM405041
B6	CLOTH(10X30XT1.0) L9814UQ	0EM405137
B7⚠	CRITICAL PARTS WARNING LABEL B8007C3:EM41210	---------
CLN551	CRT GND WIRE CRT GND	WX1L1200-007
CLN801	WIRE ASSEMBLY SPEAKER WIRE(180MM)	WX1L9800-001
CLN802	WIRE ASSEMBLY SPEAKER WIRE(180MM)	WX1L1131-001
DG691⚠	DEGAUSSING COIL F-029 or	LLBH00ZTM029
⚠	DEGAUSSING COIL AVDG156	LLBH00ZWR043
L1	SCREW, P-TIGHT 3X12 BIND HEAD+	GBMP3120
L2	SCREW, P-TIGHT 4X18 BIND HEAD +	GBMP4180
L3	SCREW TAPPING M4X14	DBU14140
L4	SCREW, P-TIGHT 3X10 BIND HEAD+	GBKP3100
PB1⚠	CHASISS NO. LABEL L6601UB	---------
SP801	SPEAKER S08N04	DSD0808XQ013
SP802	SPEAKER S08N04	DSD0808XQ013
Note: 1. V501 (CRT) HAS COUPLE OF SUBSTITUTIONAL PARTS AND EACH PARTS ALSO HAS MATCHING COMBINATION WITH DY551. PLEASE SEE TABLE 1 FOR DETAILS OF MATCHING COMBINATION. 2. DY551 (DEFLECTION YOKE) HAS MATCHING COMBINATION WITH V501. PLEASE SEE TABLE 1 FOR DETAILS OF MATCHING COMBINATION.		
CRT TYPE A		
DY551⚠	DEFLECTION YOKE ODY-C29029 or	LLBY00ZQS006
⚠	DEFLECTION YOKE CDY-29029F	LLBY00ZQS012
V501⚠	CRT A68KTB359X(B) or	TCRT190QS024
⚠	CRT A68KTB359X(PB) or	TCRT190QS025
⚠	CRT A68KTB259X2 or	TCRT190QS021
⚠	CRT A68KTB259X(P)	TCRT190QS023
V501-1	PCM JH88DTA	XM04000BV010
V501-2	WEDGE FT-00110W or	XV10000T4001
	WEDGE DB25SR	XV10000D9001
CRT TYPE B		
DY551⚠	DEFLECTION YOKE CDY-F2927H	LLBY00ZQS014
V501⚠	CRT A68QBT892X	TCRT190SM028
V501-1	PCM JH88DTA	XM04000BV010
V501-2	WEDGE FT-00110W or	XV10000T4001
	WEDGE DB25SR	XV10000D9001
CRT TYPE C		
DY551⚠	DEFLECTION YOKE 6150Z-1046A or	LLBY00ZGS008
⚠	DEFLECTION YOKE KDY4UWE21X	LLBY00ZMS026
V501⚠	CRT A68QBC230X	TCRT190GS043
V501-1	PCM JH88DTA	XM04000BV010
V501-2	WEDGE FT-00110W or	XV10000T4001
	WEDGE DB25SR	XV10000D9001
PACKING		
S1	CARTON L6609UK	0EM408361
S2	STYROFOAM TOP ASSEMBLY L6201UB	0EM407225
S3	STYROFOAM BOTTOM ASSEMBLY L6201UB	0EM407226
S4	SET SHEET PCEC:003502019816	0EM403887
S5	SERIAL NO. LABEL L6609UK	---------
S6	HOLD PAD L6201UB	0EM407287
S7	LABEL, EAS(H3761UD) MAKER NO.ZLLFNSLE1	---------
ACCESSORIES		
X1	POLYETHYLENE BAG 250X380XT0.03	Z325380
X2⚠	OWNER'S MANUAL L6609UK:ENGLISH/SPANISH	0EMN02218
X3	REMOTE CONTROL 130/ERC001/N0108UD or	N0108UD
	REMOTE CONTROL 130/ERC001/N0132UD	N0132UD
X4	DRY BATTERY R6P UM3 or	XB0M451GH001
	DRY BATTERY R6P/2S or	XB0M451T0001
	DRY BATTERY(SUNRISE) R6SSE/2S or	XB0M451MS002
	DRY BATTERY R6P(AR)2PX or	XB0M451HU002
	DRY BATTERY R6P(AR)2P X ICI	XB0M451HU003
X5	RETURN STOP SHEET L6100UA	0EM407076

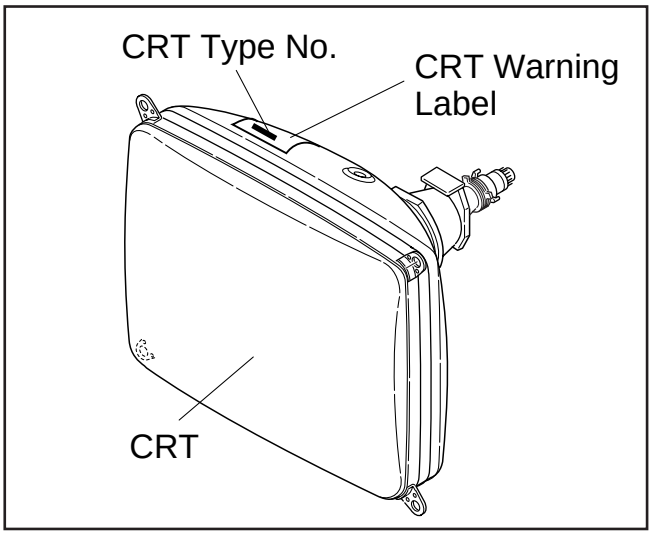
Table 1 (V501 and DY551 Combination)

Note 1: Purity and Convergence Adjustments must be performed following CRT replacement. Refer to Electrical Adjustment Instructions.

Note 2: Please confirm CRT Type No. on the CRT Warning Label which is located on the CRT. Then See the Table 1 for V501 and DY551 combination chart.
Please refer this CRT, Deflection Yoke combination chart for parts order.

V501: CRT Type No.	V501: CRT Part No.	DY551: Deflection Yoke Part No.
A68KTB359X(B)	TCRT190QS024	LLBY00ZQS006
		LLBY00ZQS012
A68KTB359X(PB)	TCRT190QS025	LLBY00ZQS006
		LLBY00ZQS012
A68KTB259X2	TCRT190QS021	LLBY00ZQS006
		LLBY00ZQS012
A68KTB259X(P)	TCRT190QS023	LLBY00ZQS006
		LLBY00ZQS012
A68QBT892X	TCRT190SM028	LLBY00ZQS014
A68QBC230X	TCRT190GS043	LLBY00ZGS008
		LLBY00ZMS026

CRT Warning Label Location



ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

NOTES:

1. Parts that are not assigned part numbers (---------) are not available.
2. Tolerance of Capacitors and Resistors are noted with the following symbols.

C.....±0.25%	D.....±0.5%	F.....±1%
G.....±2%	J.....±5%	K.....±10%
M.....±20%	N.....±30%	Z.....+80/-20%

MMA-418 CBA

Ref. No.	Description	Part No.
	MMA-418 CBA Consists of the following	0ESA05591
	MAIN CBA CRT CBA	---------- ----------

MAIN CBA

Ref. No.	Description	Part No.
	MAIN CBA Consists of the following	----------
	CAPACITORS	
C1	CERAMIC CAP.(AX) F Z 0.01µF/25V	1DA1EZT0F103
C2	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C3	ELECTROLYTIC CAP. 4.7µF/50V M or	CE1JMASTL4R7
	ELECTROLYTIC CAP. 4.7µF/50V M	CE1JMASDL4R7
C31	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C32	CERAMIC CAP.(AX) F Z 0.01µF/25V	1DA1EZT0F103
C34	ELECTROLYTIC CAP. 0.47µF/50V M or	CE1JMASTLR47
	ELECTROLYTIC CAP. 0.47µF/50V M	CE1JMASDLR47
C35	CERAMIC CAP.(AX) CH J 56pF/50V	CA1J560TU008
C36	CERAMIC CAP.(AX) B K 100pF/50V	CCA1JKT0B101
C37	CERAMIC CAP.(AX) F Z 0.1µF/50V or	CA1J104TU014
	CERAMIC CAP.(AX) F Z 0.1µF/50V	CCA1JZT0F104
C38	ELECTROLYTIC CAP. 10µF/50V M or	CE1JMASTL100
	ELECTROLYTIC CAP. 10µF/50V M	CE1JMASDL100
C41	ELECTROLYTIC CAP. 0.47µF/50V M or	CE1JMASTLR47
	ELECTROLYTIC CAP. 0.47µF/50V M	CE1JMASDLR47
C51	CERAMIC CAP(AX) B K 1000pF/50V	1CA1JKT0B102
C52	CERAMIC CAP.(AX) F Z 0.01µF/25V	1DA1EZT0F103
C53	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C54	CERAMIC CAP.(AX) B K 0.01µF/50V	CA1J103TU011
C55	CERAMIC CAP.(AX) F Z 0.01µF/25V	1DA1EZT0F103
C56	PCB JUMPER D0.6-P5.0	JW5.0T
C57	FILM CAP.(P) 0.047µF/50V J or	CMA1JJS00473
	FILM CAP.(P) 0.047µF/50V J	CA1J473MS029
C58	FILM CAP.(P) 0.033µF/50V J or	CMA1JJS00333
	FILM CAP.(P) 0.033µF/50V J	CA1J333MS029
C111	ELECTROLYTIC CAP. 47µF/16V M or	CE1CMASTL470
	ELECTROLYTIC CAP. 47µF/16V M	CE1CMASDL470
C112	ELECTROLYTIC CAP. 4.7µF/50V M or	CE1JMASTL4R7
	ELECTROLYTIC CAP. 4.7µF/50V M	CE1JMASDL4R7
C113	CERAMIC CAP.(AX) F Z 0.1µF/50V or	CA1J104TU014
	CERAMIC CAP.(AX) F Z 0.1µF/50V	CCA1JZT0F104
C114	FILM CAP.(P) 0.001µF/50V J or	CMA1JJS00102
	FILM CAP.(P) 0.001µF/50V J	CA1J102MS029
C115	ELECTROLYTIC CAP. 0.1µF/50V M or	CE1JMASTLR10
	ELECTROLYTIC CAP. 0.1µF/50V M or	CE1JMASDLR10
	ELECTROLYTIC CAP. 0.1µF/50V M	CE1JMASDL0R1
C116	CERAMIC CAP.(AX) B K 220pF/50V	1CA1JKT0B221
C117	CERAMIC CAP.(AX) Y K 0.01µF/16V	CDA1CKT0Y103
C119	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C120	CERAMIC CAP.(AX) F Z 0.01µF/25V	1DA1EZT0F103
C121	CERAMIC CAP.(AX) X K 1200pF/16V	CDA1CKT0X122
C132	CERAMIC CAP.(AX) F Z 0.1µF/50V or	CA1J104TU014
	CERAMIC CAP.(AX) F Z 0.1µF/50V	CCA1JZT0F104
C133	CERAMIC CAP.(AX) F Z 0.01µF/25V	1DA1EZT0F103
C151	CERAMIC CAP.(AX) F Z 0.01µF/25V	1DA1EZT0F103
C152	CERAMIC CAP.(AX) B K 220pF/50V	1CA1JKT0B221
C153	CERAMIC CAP.(AX) B K 220pF/50V	1CA1JKT0B221
C155	ELECTROLYTIC CAP. 47µF/16V M or	CE1CMASTL470
	ELECTROLYTIC CAP. 47µF/16V M	CE1CMASDL470
C156	CERAMIC CAP.(AX) F Z 0.1µF/50V or	CA1J104TU014
	CERAMIC CAP.(AX) F Z 0.1µF/50V	CCA1JZT0F104
C301	CERAMIC CAP.(AX) CH J 120pF/50V	CA1J121TU008
C302	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C303	CERAMIC CAP.(AX) B K 0.015µF/50V	1A1J153TU011
C306	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C308	ELECTROLYTIC CAP. 0.47µF/50V M or	CE1JMASTLR47
	ELECTROLYTIC CAP. 0.47µF/50V M	CE1JMASDLR47
C322	ELECTROLYTIC CAP. 0.47µF/50V M or	CE1JMASTLR47
	ELECTROLYTIC CAP. 0.47µF/50V M	CE1JMASDLR47
C324	ELECTROLYTIC CAP. 10µF/50V M or	CE1JMASTL100
	ELECTROLYTIC CAP. 10µF/50V M	CE1JMASDL100
C325	CERAMIC CAP.(AX) B K 220pF/50V	1CA1JKT0B221
C328	ELECTROLYTIC CAP. 10µF/50V M or	CE1JMASTL100
	ELECTROLYTIC CAP. 10µF/50V M	CE1JMASDL100
C329	CERAMIC CAP.(AX) F Z 0.01µF/25V	1DA1EZT0F103
C330	STACKED FILM CAP. 0.47µF/50V J	CMA1JJS00474
C341	CERAMIC CAP.(AX) B K 0.01µF/50V	CA1J103TU011
C342	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C343	CERAMIC CAP.(AX) B K 0.01µF/50V	CA1J103TU011
C345	ELECTROLYTIC CAP. 2200µF/10V M	CE1AMZNTL222
C347	ELECTROLYTIC CAP. 470µF/10V M or	CE1AMASTL471
	ELECTROLYTIC CAP. 470µF/10V M	CE1AMASDL471

Ref. No.	Description	Part No.
C349	ELECTROLYTIC CAP. 470µF/10V M or	CE1AMASTL471
	ELECTROLYTIC CAP. 470µF/10V M	CE1AMASDL471
C353	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C401	CERAMIC CAP.(AX) X K 4700pF/16V	CDA1CKT0X472
C402	MYLAR CAP. 0.22µF/50V J or	CMA1JJS00224
	FILM CAP.(P) 0.22µF/50V J	CA1J224MS029
C403	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C404	ELECTROLYTIC CAP. 0.1µF/50V M or	CE1JMASTLR10
	ELECTROLYTIC CAP. 0.1µF/50V M or	CE1JMASDLR10
	ELECTROLYTIC CAP. 0.1µF/50V M	CE1JMASDL0R1
C405	ELECTROLYTIC CAP. 47µF/16V M or	CE1CMASTL470
	ELECTROLYTIC CAP. 47µF/16V M	CE1CMASDL470
C408	CERAMIC CAP.(AX) F Z 0.1µF/50V or	CA1J104TU014
	CERAMIC CAP.(AX) F Z 0.1µF/50V	CCA1JZT0F104
C409	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C421	CERAMIC CAP.(AX) X K 4700pF/16V	CDA1CKT0X472
C422	CERAMIC CAP.(AX) X K 4700pF/16V	CDA1CKT0X472
C423	PCB JUMPER D0.6-P5.0	JW5.0T
C424	PCB JUMPER D0.6-P5.0	JW5.0T
C431	ELECTROLYTIC CAP. 2.2µF/50V M or	CE1JMASTL2R2
	ELECTROLYTIC CAP. 2.2µF/50V M	CE1JMASDL2R2
C432	ELECTROLYTIC CAP. 10µF/50V M or	CE1JMASTL100
	ELECTROLYTIC CAP. 10µF/50V M	CE1JMASDL100
C433	CERAMIC CAP.(AX) X K 2700pF/16V	CDA1CKT0X272
C434	FILM CAP.(P) 0.1µF/50V J or	CMA1JJS00104
	FILM CAP.(P) 0.1µF/50V J	CA1J104MS029
C435	CERAMIC CAP.(AX) F Z 0.01µF/25V	1DA1EZT0F103
C441	CERAMIC CAP.(AX) F Z 0.01µF/25V	1DA1EZT0F103
C442	ELECTROLYTIC CAP. 10µF/50V M or	CE1JMASTL100
	ELECTROLYTIC CAP. 10µF/50V M	CE1JMASDL100
C446	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C527⚠	ELECTROLYTIC CAP. 3.3µF/50V M or	CE1JMASTL3R3
⚠	ELECTROLYTIC CAP. 3.3µF/50V M	CE1JMASDL3R3
C531	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C532	ELECTROLYTIC CAP. 47µF/35V M or	CE1GMASTL470
	ELECTROLYTIC CAP. 47µF/35V M	CE1GMASDL470
C533	FILM CAP.(P) 0.1µF/50V J or	CMA1JJS00104
	FILM CAP.(P) 0.1µF/50V J	CA1J104MS029
C535	ELECTROLYTIC CAP. 1.5µF/50V M LL	CE1JMASLL1R5
C539⚠	ELECTROLYTIC CAP. 1000µF/25V M or	CE1EMZNTL102
⚠	ELECTROLYTIC CAP. 1000µF/25V M or	CE1EMZPDL102
⚠	ELECTROLYTIC CAP. 1000µF/25V M	CE1EMZADL102
C541	ELECTROLYTIC CAP. 470µF/35V M(VR) or	CE1GMZNTL471
	ELECTROLYTIC CAP. 470µF/35V M or	CE1GMZADL471
	ELECTROLYTIC CAP. 470µF/35V M	CE1GMZNDL471
C551	PCB JUMPER D0.6-P7.5	JW7.5T
C552⚠	METALIZED PLYESTER CAP. 1µF/100V J	CT2A105MS065
C556	FILM CAP.(P) 0.1µF/50V J or	CMA1JJS00104
	FILM CAP.(P) 0.1µF/50V J	CA1J104MS029
C561	ELECTROLYTIC CAP. 47µF/35V M or	CE1GMASTL470
	ELECTROLYTIC CAP. 47µF/35V M	CE1GMASDL470
C562	ELECTROLYTIC CAP. 470µF/25V M or	CE1EMZNTL471

Ref. No.	Description	Part No.
	ELECTROLYTIC CAP. 470µF/25V M or	CE1EMZNDL471
	ELECTROLYTIC CAP. 470µF/25V M	CE1EMZADL471
C565	FILM CAP.(P) 0.1µF/50V J or	CMA1JJS00104
	FILM CAP.(P) 0.1µF/50V J	CA1J104MS029
C567⚠	PP CAP. 0.0033µF/1.6KV J or	CA3C332VC010
⚠	PP CAP. 0.0033µF/1.6KV J or	CT3C332MS039
⚠	PP CAP. 0.0033µF/1.6KV J or	CBH3CJQ00332
⚠	METALLIZED FILM CAP. 0.0033µF/1.6KV J or	CT3C332F7002
⚠	METALLIZED FILM CAP. 0.0033µF/1.6KV J	CT3C332F7004
C568	CERAMIC CAP.(AX) B K 0.022µF/50V	CA1J223TU011
C571⚠	P.P. CAP 0.33µF/200V J or	CA2D334VC012
⚠	PP CAP. 0.33µF/250V J or	CT2E334MS041
⚠	METALLIZED FILM CAP. 0.33µF/200V J or	CT2D334F7001
⚠	METALLIZED FILM CAP. 0.33µF/200V J	CT2D334F7003
C572	P.P. CAP 0.18µF/200V J or	CA2D184VC012
	PP CAP. 0.18µF/250V J or	CT2E184MS041
	METALLIZED FILM CAP. 0.18µF/200V J or	CT2D184F7001
	METALLIZED FILM CAP. 0.18µF/200V J	CT2D184F7003
C574⚠	ELECTROLYTIC CAP. 10µF/250V M	CE2EMASDL100
C577	ELECTROLYTIC CAP. 47µF/35V M or	CE1GMASTL470
	ELECTROLYTIC CAP. 47µF/35V M	CE1GMASDL470
C578	FILM CAP.(P) 0.01µF/50V J or	CMA1JJS00103
	FILM CAP.(P) 0.01µF/50V J	CA1J103MS029
C580⚠	PP CAP. 0.015µF/1.6KV J or	CA3C153VC010
⚠	PP CAP. 0.015µF/1.6KV J or	CT3C153MS039
⚠	PP CAP. 0.015µF/1.6KV J or	CBH3CJQ00153
⚠	METALLIZED FILM CAP. 0.015µF/1.6KV J	CT3C153F7004
C582⚠	P.P. CAP. 0.022µF/200V J or	CA2D223VC013
⚠	P.P. CAP. 0.022µF/200V K or	CBP2DKD00223
⚠	METALLIZED FILM CAP. 0.022µF/200V J	CT2D223F7002
C584⚠	ELECTROLYTIC CAP. 1µF/160V M or	CE2CMASTL1R0
⚠	ELECTROLYTIC CAP. 1µF/160V M	CE2CMASDL1R0
C585	CERAMIC CAP. B K 100pF/500V	CCD2JKS0B101
C591	ELECTROLYTIC CAP. 10µF/50V M or	CE1JMASTL100
	ELECTROLYTIC CAP. 10µF/50V M	CE1JMASDL100
C601⚠	METALLIZED FILM CAP. 0.1µF/250V or	CT2E104MS037
⚠	FILM CAP.(MP) 0.1µF/250V K or	CT2E104DC011
⚠	METALLIZED FILM CAP. 0.1µF/275V K	CT2E104HJE06
C603	CERAMIC CAP.(AX) B K 470pF/50V	CCA1JKT0B471
C605	CERAMIC CAP. F Z 0.01µF/500V or	CCD2JZP0F103
	CERAMIC CAP. 0.01µF/AC250V	CCD2EZA0F103
C606	CERAMIC CAP. F Z 0.01µF/500V or	CCD2JZP0F103
	CERAMIC CAP. 0.01µF/AC250V	CCD2EZA0F103
C609	CERAMIC CAP. B K 1000pF/2KV or	CCD3DKD0B102
	CERAMIC CAP. B K 1000pF/2KV or	CCD3DKP0B102
	CERAMIC CAP. 1000pF/2KV	CA3D102PAN04
C610⚠	ELECTROLYTIC CAP. 470µF/200V or	CA2D471NC013
⚠	ELECTROLYTIC CAP. 470µF/200V M	CE2DMZNDL471
C611	FILM CAP.(P) 0.0056µF/50V J or	CMA1JJS00562
	FILM CAP.(P) 0.0056µF/50V J	CA1J562MS029
C613	FILM CAP.(P) 0.056µF/50V J or	CMA1JJS00563
	FILM CAP.(P) 0.056µF/50V J	CA1J563MS029
C614	CERAMIC CAP.(AX) X K 2700pF/16V	CDA1CKT0X272
C615	CERAMIC CAP.(AX) B K 100pF/50V	CCA1JKT0B101
C616	FILM CAP.(P) 0.1µF/50V J or	CMA1JJS00104
	FILM CAP.(P) 0.1µF/50V J	CA1J104MS029
C618	FILM CAP.(P) 0.1µF/50V J or	CMA1JJS00104
	FILM CAP.(P) 0.1µF/50V J	CA1J104MS029
C643⚠	CERAMIC CAP. 0.0047µF F CS or	CCG2HMN0F472
⚠	SAFETY CAP. E M 4700pF/250V KH or	CCG2EMP0E472
⚠	SAFETY CAP. 4700pF/250V	CCG2EMA0F472

Ref. No.	Description	Part No.
C654⚠	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
⚠	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
⚠	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C655	ELECTROLYTIC CAP. 1000µF/16V M(VR/HC) or	CE1CMZNTL102
	ELECTROLYTIC CAP. 1000µF/16V M or	CE1CMZPDL102
	ELECTROLYTIC CAP. 1000µF/16V M	CE1CMZADL102
C656	ELECTROLYTIC CAP. 100µF/160V M or	CE2CMZPTL101
	ELECTROLYTIC CAP. 100µF/160V M	CE2CMZNDL101
C657	ELECTROLYTIC CAP. 470µF/35V M(VR) or	CE1GMZNTL471
	ELECTROLYTIC CAP. 470µF/35V M or	CE1GMZADL471
	ELECTROLYTIC CAP. 470µF/35V M	CE1GMZNDL471
C658⚠	ELECTROLYTIC CAP. 1000µF/16V M(VR/HC) or	CE1CMZNTL102
⚠	ELECTROLYTIC CAP. 1000µF/16V M or	CE1CMZPDL102
⚠	ELECTROLYTIC CAP. 1000µF/16V M	CE1CMZADL102
C667	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C681	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C682	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C683	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C686	ELECTROLYTIC CAP. 33µF/16V M or	CE1CMASTL330
	ELECTROLYTIC CAP. 33µF/16V M	CE1CMASDL330
C687	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C692	ELECTROLYTIC CAP. 100µF/160V M or	CE2CMZPTL101
	ELECTROLYTIC CAP. 100µF/160V M	CE2CMZNDL101
C701	CERAMIC CAP.(AX) B K 100pF/50V	CCA1JKT0B101
C711	CERAMIC CAP.(AX) X K 4700pF/16V	CDA1CKT0X472
C712	ELECTROLYTIC CAP. 0.47µF/50V M or	CE1JMASTLR47
	ELECTROLYTIC CAP. 0.47µF/50V M	CE1JMASDLR47
C721	CERAMIC CAP.(AX) X K 4700pF/16V	CDA1CKT0X472
C722	ELECTROLYTIC CAP. 0.47µF/50V M or	CE1JMASTLR47
	ELECTROLYTIC CAP. 0.47µF/50V M	CE1JMASDLR47
C801	ELECTROLYTIC CAP. 470µF/16V M or	CE1CMASTL471
	ELECTROLYTIC CAP. 470µF/16V M	CE1CMASDL471
C802	ELECTROLYTIC CAP. 470µF/16V M or	CE1CMASTL471
	ELECTROLYTIC CAP. 470µF/16V M	CE1CMASDL471
C803	FILM CAP.(P) 0.1µF/50V J or	CMA1JJS00104
	FILM CAP.(P) 0.1µF/50V J	CA1J104MS029
C804	FILM CAP.(P) 0.1µF/50V J or	CMA1JJS00104
	FILM CAP.(P) 0.1µF/50V J	CA1J104MS029
C808	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C809	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C812	ELECTROLYTIC CAP. 22µF/16V M or	CE1CMASTL220
	ELECTROLYTIC CAP. 22µF/16V M	CE1CMASDL220
C814	ELECTROLYTIC CAP. 100µF/16V M or	CE1CMASTL101
	ELECTROLYTIC CAP. 100µF/16V M	CE1CMASDL101
C821	ELECTROLYTIC CAP. 470µF/16V M or	CE1CMASTL471
	ELECTROLYTIC CAP. 470µF/16V M	CE1CMASDL471
C822	ELECTROLYTIC CAP. 470µF/16V M or	CE1CMASTL471
	ELECTROLYTIC CAP. 470µF/16V M	CE1CMASDL471
C827⚠	ELECTROLYTIC CAP. 100µF/16V M or	CE1CMASTL101
⚠	ELECTROLYTIC CAP. 100µF/16V M	CE1CMASDL101
C831	ELECTROLYTIC CAP. 100µF/16V M or	CE1CMASTL101
	ELECTROLYTIC CAP. 100µF/16V M	CE1CMASDL101
C833	CERAMIC CAP.(AX) F Z 0.01µF/25V	1DA1EZT0F103
	CONNECTORS	
CN571⚠	CONNECTOR BASE, 5P TV-50P-05-V3 or	J3TVC05TG002
⚠	CONNECTOR BASE, 5P RTB-1.5-5P or	J3RTC05JG001
⚠	CONNECTOR BASE, 5P W-P3005-02	1730812
CN691⚠	CONNECTOR BASE, 2P TV-50P-02-V3 or	J3TVC02TG002
⚠	CONNECTOR BASE, 2P RTB-1.5-2P	J3RTC02JG001
CN801	STRAIGHT CONNECTOR BASE 00 8283 0212 00 000 or	J383C02UG002
	STRAIGHT PIN HEADER, 2P 173981-2	1770258
CN802	STRAIGHT CONNECTOR BASE 00 8283 0212 00 000 or	J383C02UG002
	STRAIGHT PIN HEADER, 2P 173981-2	1770258
	DIODES	
D101	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D102	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D131	ZENER DIODE MTZJT-775.1B or	QDTB0MTZJ5R1
	ZENER DIODE DZ-5.1BSBT265	NDTB0DZ5R1BS
D151	ZENER DIODE MTZJT-775.6B or	QDTB0MTZJ5R6
	ZENER DIODE DZ-5.6BSBT265	NDTB0DZ5R6BS
D181	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D322	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D323	ZENER DIODE MTZJT-7710B or	QDTB00MTZJ10
	ZENER DIODE DZ-10BSBT265	NDTB00DZ10BS
D326	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D327	ZENER DIODE MTZJT-778.2B or	QDTB0MTZJ8R2
	ZENER DIODE DZ-8.2BSBT265	NDTB0DZ8R2BS
D351	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D352	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D353	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D525⚠	ZENER DIODE MTZJT-7720B or	QDTB00MTZJ20
⚠	ZENER DIODE DZ-20BSBT265	NDTB00DZ20BS
D526⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148	NDTZ001N4148
D532	DIODE 1N5397-B or	NDLZ001N5397
	RECTIFIER DIODE ERA15-02	AERA1502****
D552⚠	ZENER DIODE MTZJT-7715B or	QDTB00MTZJ15
⚠	ZENER DIODE DZ-15BSBT265	NDTB00DZ15BS
D558	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D571⚠	DIODE FR104-B or	NDLZ000FR104
⚠	RECTIFIER DIODE ERA22-02 or	QDPZ0ERA2202
⚠	RECTIFIER DIODE 10ELS2	QDQZ0010ELS2
D572⚠	RECTIFIER DIODE ERA22-02 or	QDPZ0ERA2202
⚠	RECTIFIER DIODE 10ELS2	QDQZ0010ELS2
D573⚠	RECTIFIER DIODE ERA22-02 or	QDPZ0ERA2202
⚠	RECTIFIER DIODE 10ELS2	QDQZ0010ELS2
D580	DIODE ERD07-15	QDLZ0ERD0715
D582	FAST RECOVERY DIODE ERD38-06	QDQZ0ERD3806
D583	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D584⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133

Ref. No.	Description	Part No.
	SWITCHING DIODE 1N4148	NDTZ001N4148
D585	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D586	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D587	ZENER DIODE MTZJT-776.8B or	QDTB0MTZJ6R8
	ZENER DIODE DZ-6.8BSBT265	NDTB0DZ6R8BS
D588	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D591⚠	ZENER DIODE MTZJT-7736B or	QDTB00MTZJ36
⚠	ZENER DIODE DZ-36BSBT265	NDTB00DZ36BS
D595⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148	NDTZ001N4148
D597	ZENER DIODE MTZJT-776.8B or	QDTB0MTZJ6R8
	ZENER DIODE DZ-6.8BSBT265	NDTB0DZ6R8BS
D605⚠	DIODE 1N5406 or	NDLZ001N5406
⚠	DIODE ERC04-06L3	QD4Z0ERC0406
D606⚠	DIODE 1N5406 or	NDLZ001N5406
⚠	DIODE ERC04-06L3	QD4Z0ERC0406
D607⚠	DIODE 1N5406 or	NDLZ001N5406
⚠	DIODE ERC04-06L3	QD4Z0ERC0406
D608⚠	DIODE 1N5406 or	NDLZ001N5406
⚠	DIODE ERC04-06L3	QD4Z0ERC0406
D609	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D611⚠	ZENER DIODE MTZJT-7715B or	QDTB00MTZJ15
⚠	ZENER DIODE DZ-15BSBT265	NDTB00DZ15BS
D615⚠	SWITCHING DIODE 1N4148 T-77	QDTZ001N4148
D621	ZENER DIODE MTZJT-777.5B or	QDTB0MTZJ7R5
	ZENER DIODE DZ-7.5BSBT265	NDTB0DZ7R5BS
D622	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D641	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D642⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148	NDTZ001N4148
D651⚠	FAST RECOVERY DIODE 30DF6 or	QDWZ00030DF6
⚠	DIODE ERD29-06J or	QD4Z0ERD2906
⚠	FAST RECOVERY DIODE FE201-6	QDLZ00FE2016
D652⚠	DIODE FR154 or	NDLZ000FR154
⚠	FAST RECOVERY DIODE ERB44-02	QDPZ0ERB4402
D653	DIODE FR154 or	NDLZ000FR154
	FAST RECOVERY DIODE ERB44-02	QDPZ0ERB4402
D654⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148	NDTZ001N4148
D655⚠	DIODE FR154 or	NDLZ000FR154
⚠	FAST RECOVERY DIODE ERB44-02	QDPZ0ERB4402
D657⚠	DIODE 1ZC36	QDQZ0001ZC36
D660	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D661⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148	NDTZ001N4148
D662⚠	ZENER DIODE MTZJT-776.8B or	QDTB0MTZJ6R8
⚠	ZENER DIODE DZ-6.8BSBT265	NDTB0DZ6R8BS
D666	ZENER DIODE MTZJT-7736B or	QDTB00MTZJ36
	ZENER DIODE DZ-36BSBT265	NDTB00DZ36BS
D671⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148	NDTZ001N4148
D672	PCB JUMPER D0.6-P5.0	JW5.0T
D673	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148

Ref. No.	Description	Part No.
D681	ZENER DIODE MTZJT-779.1B or	QDTB0MTZJ9R1
	ZENER DIODE DZ-9.1BSBT265	NDTB0DZ9R1BS
D683	SCHOTTKY BARRIER DIODE ERA81-004	QDPZERA81004
D691⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148	NDTZ001N4148
D695	ZENER DIODE MTZJT-778.2B or	QDTB0MTZJ8R2
	ZENER DIODE DZ-8.2BSBT265	NDTB0DZ8R2BS
D696	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D826	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148	NDTZ001N4148
D838	ZENER DIODE MTZJT-7710B or	QDTB00MTZJ10
	ZENER DIODE DZ-10BSBT265	NDTB00DZ10BS
D841⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148	NDTZ001N4148
D842⚠	ZENER DIODE MTZJT-775.1B or	QDTB0MTZJ5R1
⚠	ZENER DIODE DZ-5.1BSBT265	NDTB0DZ5R1BS
D845⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148	NDTZ001N4148
	ICS	
IC31	IC:VIF/SIF DETECTOR M61111FP	QSZBA0SMB010
IC111⚠	IC M61271M8-050FP-61	QSZAB0RMB127
IC151	IC:MEMORY S524C20D21 or	NSZBA0SSM028
	IC:MEMORY AT24C02N-10SC or	NSMMA0SAZ012
	IC(EEPROM) M24C02-MN6 or	NSMMA0SSS028
	IC:MEMORY BR24C02F-W or	QSMBA0SRM003
	IC:MEMORY BR24C02F or	QSMMA0SRM003
	IC:EEPROM CAT24WC02JI or	NSZBA0SBG001
	IC(EEP-ROM) M24C02-WMN6	NSZAA0SSS004
IC401	IC:USA STEREO DECODER LA7765	QSZBA0SSY003
IC481	IC:SWITCHING TC4052BF(EL) or	QSZBA0TTS096
	IC:SWITCHING CD4052BCSJX	NSZBA0TF3079
IC551⚠	IC:VERTICAL OUTPUT LA78041 or	QSZBA0SSY006
⚠	IC:VERTICAL OUTPUT LA78045	QSZBA0SSY004
IC601⚠	PHOTOCOUPLER PS2501-1W or	QPEW0PS25011
⚠	PHOTO COUPLER PS2501-1L or	QPEL0PS25011
⚠	PHOTOCOUPLER LTV-817B-F or	NPEB0LTV817F
⚠	PHOTOCOUPLER LTV-817C-F	NPEC0LTV817F
IC802	AUDIO POWER IC AN17805A	QSZBA0SMS007
	COILS	
L1	PCB JUMPER D0.6-P5.0	JW5.0T
L3	INDUCTOR 22µH-K-5FT or	LLARKBSTU220
	INDUCTOR 22µH-K	LLARKDQKA220
L32	INDUCTOR 15µH-J-26T or	LLAXJATTU150
	INDUCTOR 15µH-K-26T	LLAXKDTKA150
L33	INDUCTOR 22µH-J-26T or	LLAXJATTU220
	INDUCTOR 22µH-K-26T	LLAXKDTKA220
L51	INDUCTOR 100µH-K-5FT or	LLARKBSTU101
	INDUCTOR 100µH-K	LLARKDQKA101
L111	INDUCTOR 22µH-K-5FT or	LLARKBSTU220
	INDUCTOR 22µH-K	LLARKDQKA220
L301	INDUCTOR 100µH-K-5FT or	LLARKBSTU101
	INDUCTOR 100µH-K	LLARKDQKA101
L341	PCB JUMPER D0.6-P5.0	JW5.0T
L342	PCB JUMPER D0.6-P5.0	JW5.0T
L561	LINEARITY COIL ELH5L6136N	LLBD00PMS008
L562	LINEARITY COIL ST02LN or	LLBD00ZY2003
	CHOKE COIL ELC13B102L or	LLC102KMS001
	CHOKE COIL CSA-LF048	LLBD00ZSA003
L601⚠	LINE FILTER JLB2808 or	LLBG00ZXB004

Ref. No.	Description	Part No.
⚠	LINE FILTER MS036 or	LLBG00ZY2009
⚠	LINE FILTER CSA-LF032	LLBG00ZSA007
L692	CHOKE COIL 47μH-K or	LLBD00PKV007
	POT COIL 47μH K or	LLBD**DMM001
	POT COIL 47μH K	LLBD00DQE001
	TRANSISTORS	
Q31	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q111	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q321⚠	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
⚠	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
⚠	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
⚠	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
⚠	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
⚠	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
⚠	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
⚠	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q411	TRANSISTOR 2SA1175(F) or	QQSF02SA1175
	TRANSISTOR KTA1267(GR) or	NQS10KTA1267
	TRANSISTOR KTA1266(GR) or	NQS40KTA1266
	TRANSISTOR 2SA1318(T)-AANP or	2SA1318TZ
	TRANSISTOR 2SA1318(U)-AANP or	2SA1318UZ
	TRANSISTOR 2SA1015-GR(TPE2)	QQS102SA1015
Q441	TRANSISTOR 2SA1175(F) or	QQSF02SA1175
	TRANSISTOR KTA1267(GR) or	NQS10KTA1267
	TRANSISTOR KTA1266(GR) or	NQS40KTA1266
	TRANSISTOR 2SA1318(T)-AANP or	2SA1318TZ
	TRANSISTOR 2SA1318(U)-AANP or	2SA1318UZ
	TRANSISTOR 2SA1015-GR(TPE2)	QQS102SA1015
Q481	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q531	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q532	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785

Ref. No.	Description	Part No.
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q551⚠	TRANSISTOR 2SA1175(F) or	QQSF02SA1175
⚠	TRANSISTOR KTA1267(GR) or	NQS10KTA1267
⚠	TRANSISTOR KTA1266(GR) or	NQS40KTA1266
⚠	TRANSISTOR 2SA1318(T)-AANP or	2SA1318TZ
⚠	TRANSISTOR 2SA1318(U)-AANP or	2SA1318UZ
⚠	TRANSISTOR 2SA1015-GR(TPE2)	QQS102SA1015
Q552⚠	TRANSISTOR 2SD1666R or	QQER02SD1666
⚠	TRANSISTOR 2SD1666S or	QQES02SD1666
⚠	TRANSISTOR KTD2059(O) or	NQ400KTD2059
⚠	TRANSISTOR KTD2059(Y) or	NQ4Y0KTD2059
⚠	TRANSISTOR 2SD1825	Q2SD1825****
Q553	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q561	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q571⚠	TRANSISTOR 2SD2634 or	QQZZ02SD2634
⚠	TRANSISTOR TT2142	QQZZ00TT2142
Q572	TRANSISTOR 2SC1627Y-TPE2	QQSY02SC1627
Q601⚠	FET 2SK3407	QFFZ02SK3407
Q602⚠	TRANSISTOR 2SC2120-O-TPE2 or	QQS002SC2120
⚠	TRANSISTOR 2SC2120-Y(TPE2)	QQSY02SC2120
Q641	TRANSISTOR 2SA1175(F) or	QQSF02SA1175
	TRANSISTOR KTA1267(GR) or	NQS10KTA1267
	TRANSISTOR KTA1266(GR) or	NQS40KTA1266
	TRANSISTOR 2SA1318(T)-AANP or	2SA1318TZ
	TRANSISTOR 2SA1318(U)-AANP or	2SA1318UZ
	TRANSISTOR 2SA1015-GR(TPE2)	QQS102SA1015
Q662⚠	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
⚠	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
⚠	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
⚠	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
⚠	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
⚠	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
⚠	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
⚠	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q671⚠	TRANSISTOR 2SA1175(F) or	QQSF02SA1175
⚠	TRANSISTOR KTA1267(GR) or	NQS10KTA1267
⚠	TRANSISTOR KTA1266(GR) or	NQS40KTA1266
⚠	TRANSISTOR 2SA1318(T)-AANP or	2SA1318TZ
⚠	TRANSISTOR 2SA1318(U)-AANP or	2SA1318UZ
⚠	TRANSISTOR 2SA1015-GR(TPE2)	QQS102SA1015
Q675	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785

Ref. No.	Description	Part No.
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q676	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q681	TRANSISTOR 2SC2120-O-TPE2 or	QQS002SC2120
	TRANSISTOR 2SC2120-Y(TPE2) or	QQSY02SC2120
	TRANSISTOR KTC3203(Y)	NQSY0KTC3203
Q682	TRANSISTOR 2SC2120-O-TPE2 or	QQS002SC2120
	TRANSISTOR 2SC2120-Y(TPE2) or	QQSY02SC2120
	TRANSISTOR KTC3203(Y)	NQSY0KTC3203
Q683	TRANSISTOR 2SC2120-O-TPE2 or	QQS002SC2120
	TRANSISTOR 2SC2120-Y(TPE2) or	QQSY02SC2120
	TRANSISTOR KTC3203(Y)	NQSY0KTC3203
Q696	RES. BUILT-IN TRANSISTOR BA1F4M-T or	QQSZ00BA1F4M
	RES. BUILT-IN TRANSISTOR KRC103M	NQSZ0KRC103M
Q825	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q831⚠	TRANSISTOR 2SB892(S) or	QQSS002SB892
⚠	TRANSISTOR 2SB892(T)	QQST002SB892
Q832	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q833⚠	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
⚠	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
⚠	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
⚠	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
⚠	TRANSISTOR KTC3198(GR) or	NQS40KTC3198
⚠	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
⚠	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
⚠	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
	RESISTORS	
R1	CARBON RES. 1/4W J 220 Ω or	RCX4JATZ0221
	CARBON RES. 1/4W J 160 Ω	RCX4JATZ0161
R3	PCB JUMPER D0.6-P5.0	JW5.0T
R4	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R5	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R21	CARBON RES. 1/4W J 6.8k Ω	RCX4JATZ0682
R31	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R32	CARBON RES. 1/4W J 390 Ω	RCX4JATZ0391

Ref. No.	Description	Part No.
R33	CARBON RES. 1/4W J 270 Ω	RCX4JATZ0271
R34	CARBON RES. 1/4W J 180 Ω	RCX4JATZ0181
R36	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R37	CARBON RES. 1/4W J 470 Ω	RCX4JATZ0471
R41	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R42	CARBON RES. 1/4W J 56k Ω	RCX4JATZ0563
R43	CARBON RES. 1/4W J 12k Ω	RCX4JATZ0123
R51	CARBON RES. 1/4W J 220k Ω	RCX4JATZ0224
R52	CARBON RES. 1/4W J 220k Ω	RCX4JATZ0224
R54	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R102	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R103	CARBON RES. 1/4W J 1.8k Ω	RCX4JATZ0182
R104	CARBON RES. 1/4W J 3.3k Ω	RCX4JATZ0332
R105	CARBON RES. 1/4W J 4.7k Ω	RCX4JATZ0472
R106	CARBON RES. 1/4W J 8.2k Ω	RCX4JATZ0822
R111⚠	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R112	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R113	CARBON RES. 1/4W J 470k Ω	RCX4JATZ0474
R114	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R116	CARBON RES. 1/4W J 220 Ω	RCX4JATZ0221
R132	PCB JUMPER D0.6-P5.0	JW5.0T
R133	PCB JUMPER D0.6-P5.0	JW5.0T
R135	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R136	CARBON RES. 1/4W J 100k Ω	RCX4JATZ0104
R137	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R138	CARBON RES. 1/4W J 220k Ω	RCX4JATZ0224
R139	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R140	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R141	PCB JUMPER D0.6-P5.0	JW5.0T
R151	CARBON RES. 1/4W J 4.7k Ω	RCX4JATZ0472
R155	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R156	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R161	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R162	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R163	CARBON RES. 1/4W J 6.8k Ω	RCX4JATZ0682
R164	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R166	CARBON RES. 1/4W J 4.7k Ω	RCX4JATZ0472
R168	CARBON RES. 1/4W J 4.7k Ω	RCX4JATZ0472
R170	CARBON RES. 1/4W J 6.8k Ω	RCX4JATZ0682
R171	CARBON RES. 1/4W J 3.3k Ω	RCX4JATZ0332
R172	PCB JUMPER D0.6-P5.0	JW5.0T
R173	PCB JUMPER D0.6-P5.0	JW5.0T
R301	CARBON RES. 1/4W J 6.8k Ω	RCX4JATZ0682
R302	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R303	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R322	PCB JUMPER D0.6-P5.0	JW5.0T
R323	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R326	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R327	PCB JUMPER D0.6-P5.0	JW5.0T
R328	CARBON RES. 1/4W J 3.3k Ω	RCX4JATZ0332
R329	CARBON RES. 1/4W J 47k Ω	RCX4JATZ0473
R330	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R331	PCB JUMPER D0.6-P5.0	JW5.0T
R342	PCB JUMPER D0.6-P5.0	JW5.0T
R344	CARBON RES. 1/4W J 6.8k Ω	RCX4JATZ0682
R345	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R346	CARBON RES. 1/4W J 470 Ω	RCX4JATZ0471
R347⚠	PCB JUMPER D0.6-P5.0	JW5.0T
R348	CARBON RES. 1/4W J 27k Ω	RCX4JATZ0273
R355	CARBON RES. 1/4W J 33k Ω	RCX4JATZ0333
R356	CARBON RES. 1/4W J 220 Ω	RCX4JATZ0221

Ref. No.	Description	Part No.
R357	CARBON RES. 1/4W J 220 Ω	RCX4JATZ0221
R358	CARBON RES. 1/4W J 220 Ω	RCX4JATZ0221
R362	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R402	CARBON RES. 1/4W J 5.6k Ω	RCX4JATZ0562
R403	PCB JUMPER D0.6-P5.0	JW5.0T
R405	CARBON RES. 1/4W J 3.3k Ω	RCX4JATZ0332
R406	CARBON RES. 1/4W J 15k Ω	RCX4JATZ0153
R407	CARBON RES. 1/4W J 6.8k Ω	RCX4JATZ0682
R408	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R409	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R412	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R421	CARBON RES. 1/4W J 4.7k Ω	RCX4JATZ0472
R422	CARBON RES. 1/4W J 4.7k Ω	RCX4JATZ0472
R432	CARBON RES. 1/4W J 220 Ω	RCX4JATZ0221
R435	CARBON RES. 1/4W J 470 Ω	RCX4JATZ0471
R436	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R441	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R442	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R443	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R445	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R481	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R482	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R521	CARBON RES. 1/4W J 680 Ω	RCX4JATZ0681
R522	CARBON RES. 1/4W J 680 Ω	RCX4JATZ0681
R523	CARBON RES. 1/4W J 680 Ω	RCX4JATZ0681
R527⚠	CARBON RES. 1/4W J 6.8k Ω	RCX4JATZ0682
R530	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R531	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R532	CARBON RES. 1/4W J 1.8k Ω	RCX4JATZ0182
R533	CARBON RES. 1/4W J 3.3 Ω	RCX4JATZ03R3
R534	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R535	CARBON RES. 1/4W J 2.7k Ω	RCX4JATZ0272
R536	CARBON RES. 1/4W J 470 Ω	RCX4JATZ0471
R537	CARBON RES. 1/4W J 68k Ω	RCX4JATZ0683
R538	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R540	CARBON RES. 1/4W J 2.7k Ω	RCX4JATZ0272
R541	CARBON RES. 1/4W J 2.7k Ω	RCX4JATZ0272
R542	CARBON RES. 1/4W J 2.7 Ω	RCX4JATZ02R7
R543	CARBON RES. 1/4W J 2.7 Ω	RCX4JATZ02R7
R544	CARBON RES. 1/4W J 2.7 Ω	RCX4JATZ02R7
R549⚠	METAL OXIDE FILM RES. 1W J 12 Ω or	RN01120ZU001
⚠	METAL OXIDE FILM RES. 1W J 12 Ω	RN01200DP003
R550⚠	METAL OXIDE FILM RES. 1W J 12 Ω or	RN01120ZU001
⚠	METAL OXIDE FILM RES. 1W J 12 Ω	RN01200DP003
R551	METAL OXIDE FILM RES. 2W J 680 Ω or	RN02681ZU001
	METAL OXIDE FILM RES. 2W J 680 Ω	RN02681DP004
R552⚠	METAL OXIDE FILM RES. 2W J 8.2 Ω or	RN028R2ZU001
⚠	METAL OXIDE FILM RES. 2W J 8.2 Ω	RN028R2DP004
R553	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R554	CARBON RES. 1/4W J 3.9k Ω	RCX4JATZ0392
R555	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R556	CARBON RES. 1/4W J 47k Ω	RCX4JATZ0473
R557	CARBON RES. 1/4W J 18k Ω	RCX4JATZ0183
R558	CARBON RES. 1/4W J 220 Ω	RCX4JATZ0221
R559	CARBON RES. 1/4W J 6.8k Ω	RCX4JATZ0682
R560	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R561	CARBON RES. 1/4W J 1.2k Ω	RCX4JATZ0122
R562	CARBON RES. 1/4W J 100k Ω	RCX4JATZ0104
R563	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R564	CARBON RES. 1/4W J 150k Ω	RCX4JATZ0154
R565	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223

Ref. No.	Description	Part No.
R566	CARBON RES. 1/4W J 8.2k Ω	RCX4JATZ0822
R568	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R569	CARBON RES. 1/4W J 2.7k Ω	RCX4JATZ0272
R571⚠	METAL OXIDE FILM RES. 2W J 1.2k Ω or	RN02122ZU001
⚠	METAL OXIDE FILM RES. 2W J 1.2k Ω	RN02122DP004
R572⚠	METAL OXIDE FILM RES. 2W J 1.2k Ω or	RN02122ZU001
⚠	METAL OXIDE FILM RES. 2W J 1.2k Ω	RN02122DP004
R575⚠	CARBON RES. 1/4W J 15 Ω	RCX4JATZ0150
R576⚠	CARBON RES. 1/4W J 15 Ω	RCX4JATZ0150
R577⚠	CARBON RES. 1/4W J 15 Ω	RCX4JATZ0150
R578	CARBON RES. 1/4W J 330 Ω	RCX4JATZ0331
R579	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R581	PCB JUMPER D0.6-P5.0	JW5.0T
R583⚠	METAL OXIDE FILM RES. 2W J 6.8 Ω or	RN026R8ZU001
⚠	METAL OXIDE FILM RES. 2W J 6.8 Ω	RN026R8DP004
R584⚠	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R585	CARBON RES. 1/4W J 47k Ω	RCX4JATZ0473
R586	CARBON RES. 1/4W J 220k Ω	RCX4JATZ0224
R587⚠	CARBON RES. 1/4W J 56k Ω	RCX4JATZ0563
R588	CARBON RES. 1/4W J 56k Ω	RCX4JATZ0563
R589	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R590	CARBON RES. 1/4W J 12k Ω	RCX4JATZ0123
R591⚠	CARBON RES. 1/4W J 180k Ω	RCX4JATZ0184
R592⚠	CARBON RES. 1/4W J 180k Ω	RCX4JATZ0184
R593⚠	CARBON RES. 1/4W J 100k Ω	RCX4JATZ0104
R594⚠	CARBON RES. 1/4W J 82k Ω	RCX4JATZ0823
R595	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R596	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R597	CARBON RES. 1/4W J 8.2k Ω	RCX4JATZ0822
R598⚠	CARBON RES. 1/4W J 47k Ω	RCX4JATZ0473
R599⚠	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R601⚠	CEMENT RES. 5W K 0.56 Ω or	RW05R56DP007
⚠	CEMENT RES. 5W K 0.56 Ω or	RW05R56PG001
⚠	CEMENT RESISTOR 5W K 0.50 Ω	RW05R50PAK05
R602⚠	CARBON RES. 1/4W J 820k Ω	RCX4JATZ0824
R603	CARBON RES. 1/4W J 820k Ω	RCX4JATZ0824
R604	CARBON RES. 1/4W J 820k Ω	RCX4JATZ0824
R605	CARBON RES. 1/4W J 820k Ω	RCX4JATZ0824
R611	CARBON RES. 1/4W J 220 Ω	RCX4JATZ0221
R612	CARBON RES. 1/4W J 220 Ω	RCX4JATZ0221
R613	CEMENT RES. 5W K 0.27 Ω or	RW05R27DP005
	CEMENT RESISTOR 5W K 0.27 Ω	RW05R27PG001
R614	CARBON RES. 1/4W J 47 Ω	RCX4JATZ0470
R616	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R617	CARBON RES. 1/4W J 47 Ω	RCX4JATZ0470
R620	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R621	CARBON RES. 1/4W J 1.2k Ω	RCX4JATZ0122
R623	CARBON RES. 1/4W J 39 Ω	RCX4JATZ0390
R624	PCB JUMPER D0.6-P5.0	JW5.0T
R626	CARBON RES. 1/4W J 390 Ω	RCX4JATZ0391
R642	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R643	CARBON RES. 1/4W J 120k Ω	RCX4JATZ0124
R653	CARBON RES. 1/4W J 18k Ω	RCX4JATZ0183
R654⚠	CARBON RES. 1/4W J 1.8k Ω	RCX4JATZ0182
R655⚠	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R656⚠	CARBON RES. 1/4W J 15k Ω	RCX4JATZ0153
R657⚠	CARBON RES. 1/4W J 15k Ω	RCX4JATZ0153
R658	CARBON RES. 1/4W J 470k Ω	RCX4JATZ0474
R660	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R661⚠	CARBON RES. 1/4W J 68k Ω	RCX4JATZ0683
R662⚠	CARBON RES. 1/4W J 82k Ω	RCX4JATZ0823

Ref. No.	Description	Part No.
R664⚠	CARBON RES. 1/4W J 12k Ω	RCX4JATZ0123
R665⚠	CARBON RES. 1/4W J 5.6k Ω	RCX4JATZ0562
R666⚠	METAL RESISTOR 2W J 18k Ω or	RN02183ZU001
⚠	METAL OXIDE FILM RES. 2W J 18k Ω	RN02183DP004
R667⚠	CARBON RES. 1/4W J 27k Ω	RCX4JATZ0273
R668⚠	CARBON RES. 1/4W J 33k Ω	RCX4JATZ0333
R669⚠	CARBON RES. 1/4W J 27k Ω	RCX4JATZ0273
R670⚠	CARBON RES. 1/4W J 100k Ω	RCX4JATZ0104
R671	CARBON RES. 1/4W J 3.3k Ω	RCX4JATZ0332
R672	CARBON RES. 1/4W J 3.3k Ω	RCX4JATZ0332
R673	CARBON RES. 1/4W J 100k Ω	RCX4JATZ0104
R675⚠	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R676	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R677	CARBON RES. 1/4W J 68k Ω	RCX4JATZ0683
R678	CARBON RES. 1/4W J 47k Ω	RCX4JATZ0473
R681	CARBON RES. 1/4W J 12 Ω	RCX4JATZ0120
R682⚠	METAL OXIDE FILM RES. 1W J 47 Ω or	RN01470ZU001
⚠	METAL OXIDE FILM RES. 1W J 47 Ω	RN01470DP003
R683⚠	METAL OXIDE FILM RES. 1W J 39 Ω or	RN01390ZU001
⚠	METAL OXIDE FILM RES. 1W J 39 Ω	RN01390DP003
R684	CARBON RES. 1/4W J 56 Ω	RCX4JATZ0560
R685	CARBON RES. 1/4W J 56 Ω	RCX4JATZ0560
R686⚠	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R687⚠	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R691	CARBON RES. 1/4W J 15k Ω	RCX4JATZ0153
R696	CARBON RES. 1/4W J 10 Ω	RCX4JATZ0100
R701	CARBON RES. 1/4W J 75 Ω	RCX4JATZ0750
R702	PCB JUMPER D0.6-P5.0	JW5.0T
R703	PCB JUMPER D0.6-P5.0	JW5.0T
R711	CARBON RES. 1/4W J 47k Ω	RCX4JATZ0473
R712	CARBON RES. 1/4W J 3.9k Ω	RCX4JATZ0392
R713	CARBON RES. 1/4W J 39k Ω	RCX4JATZ0393
R721	CARBON RES. 1/4W J 47k Ω	RCX4JATZ0473
R722	CARBON RES. 1/4W J 3.9k Ω	RCX4JATZ0392
R723	CARBON RES. 1/4W J 39k Ω	RCX4JATZ0393
R771	CARBON RES. 1/4W J 27k Ω	RCX4JATZ0273
R772	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R773	CARBON RES. 1/4W J 68k Ω	RCX4JATZ0683
R774	CARBON RES. 1/4W J 68k Ω	RCX4JATZ0683
R776	CARBON RES. 1/4W J 27k Ω	RCX4JATZ0273
R777	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R803	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R804	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R811	PCB JUMPER D0.6-P5.0	JW5.0T
R812	PCB JUMPER D0.6-P5.0	JW5.0T
R817	CARBON RES. 1/4W J 1.8k Ω	RCX4JATZ0182
R818	CARBON RES. 1/4W J 27k Ω	RCX4JATZ0273
R828	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R829	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R831	CARBON RES. 1/4W J 680 Ω	RCX4JATZ0681
R832	CARBON RES. 1/4W J 22k Ω	RCX4JATZ0223
R833	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R834	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R837	PCB JUMPER D0.6-P5.0	JW5.0T
R838	CARBON RES. 1/4W J 1k Ω	RCX4JATZ0102
R841	METAL RESISTER. 2W J 2.7 Ω or	RN022R7ZU001
	METAL OXIDE FILM RES. 2W J 2.7 Ω	RN022R7DP004
R843⚠	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R845	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222
R846⚠	CARBON RES. 1/4W J 2.2k Ω	RCX4JATZ0222

Ref. No.	Description	Part No.
	SWITCHES	
SW101	TACT SWITCH SKQSAB or	SST0101AL038
	TACT SWITCH KSM0612B or	SST0101HH003
	TACT SWITCH SKHHAM	SST0101AL029
SW102	TACT SWITCH SKQSAB or	SST0101AL038
	TACT SWITCH KSM0612B or	SST0101HH003
	TACT SWITCH SKHHAM	SST0101AL029
SW103	TACT SWITCH SKQSAB or	SST0101AL038
	TACT SWITCH KSM0612B or	SST0101HH003
	TACT SWITCH SKHHAM	SST0101AL029
SW104	TACT SWITCH SKQSAB or	SST0101AL038
	TACT SWITCH KSM0612B or	SST0101HH003
	TACT SWITCH SKHHAM	SST0101AL029
SW105	TACT SWITCH SKQSAB or	SST0101AL038
	TACT SWITCH KSM0612B or	SST0101HH003
	TACT SWITCH SKHHAM	SST0101AL029
SW106	TACT SWITCH SKQSAB or	SST0101AL038
	TACT SWITCH KSM0612B or	SST0101HH003
	TACT SWITCH SKHHAM	SST0101AL029
	MISCELLANEOUS	
AC601⚠	AC CORD LA-2413	WAC0172LW007
B1	HEAT SINK(PHI) L6600UZ	0EM407654
B2	HEAT SINK(PHH)ASSEMBLY L6600UZ	0EM407653
B3	HEAT SINK(PHF)ASSEMBLY L6600UZ	0EM407649
B4	HEAT SINK(PHG)ASSEMBLY L6600UZ	0EM407651
BC571	BEAD INDUCTORS FBA04HA600VB-00	LLBF00STU026
BC601	PCB JUMPER D0.6-P5.0	JW5.0T
BC602	BEAD INDUCTORS FBR07HA121TB-00	1LBF00ZTU021
BC650	BEAD INDUCTORS FBR07HA121TB-00	1LBF00ZTU021
BC651	BEAD INDUCTORS FBR07HA121TB-00	1LBF00ZTU021
BC652	BEAD INDUCTORS FBR07HA121TB-00	1LBF00ZTU021
BC653	PCB JUMPER D0.6-P5.0	JW5.0T
BC655	PCB JUMPER D0.6-P5.0	JW5.0T
BC691	BEAD INDUCTORS FBR07HA121TB-00	1LBF00ZTU021
BC692	BEAD INDUCTORS FBR07HA121TB-00	1LBF00ZTU021
CF31	CERAMIC TRAP 4.5MHz or	FBE455PMR003
	CERAMIC TRAP 4.5MHz	FBE455PMS002
CF32	CERAMIC FILTER SFSRA4M50CF00-B0 or	FBB455PMR004
	CERAMIC FILTER 4.5MHz	FBB455PMS001
CLN301	WIRE ASSEMBLY WX1L1200-102	WX1L1200-102
CLN501	WIRE ASSEMBLY WX1L1200-103	WX1L1200-103
F601⚠	FUSE 4A/125V 237 TYPE or	PAGJ20CAG402
⚠	FUSE STC4A125V U/CT or	PAGE20CW3402
⚠	FUSE 4.00A/125V	PAGG20CNG402
FH601	FUSE HOLDER MSF-015 or	XH01Z00LY001
	FUSE HOLDER FH-V-03078 or	XH01Z00DK001
	HOLDER, FUSE CNT41-0014	1790424
FH602	FUSE HOLDER MSF-015 or	XH01Z00LY001
	FUSE HOLDER FH-V-03078 or	XH01Z00DK001
	HOLDER, FUSE CNT41-0014	1790424
GP641⚠	GAP. FNR-G3.10D	FAZ000LD6005
JK701	RCA JACK 1P(YELLOW)WITH SWITCH AV1-09S-3 or	JYRL010RP009
	RCA JACK(YELLOW) MTJ-032-06A-20	JYRL010LY013
JK702	RCA JACK 1P(WHITE)WITH SWITCH AV1-09S-4 or	JYRL010RP010
	RCA JACK(WHITE) MTJ-032-06A-22	JYRL010LY015
JK703	RCA JACK 1P(RED)WITH SW ITCH AV1-09S-2 or	JYRL010RP008
	RCA JACK(RED) MTJ-032-06A-21	JYRL010LY014
JK704	RCA JACK 3P (SW) MSP-213-V2-432	JYRL030LY008
JS102	PCB JUMPER D0.6-P5.0	JW5.0T

Ref. No.	Description	Part No.
JS104	PCB JUMPER D0.6-P5.0	JW5.0T
JS342	PCB JUMPER D0.6-P5.0	JW5.0T
JS642	PCB JUMPER D0.6-P10.0	JW10.0T
JS704	PCB JUMPER D0.6-P5.0	JW5.0T
JS706	PCB JUMPER D0.6-P5.0	JW5.0T
JS801	PCB JUMPER D0.6-P5.0	JW5.0T
JS802	PCB JUMPER D0.6-P5.0	JW5.0T
JS855	PCB JUMPER D0.6-P5.0	JW5.0T
L1	SCREW, B-TIGHT M3X8 BIND HEAD+	GBMB3080
PS691⚠	THERMISTOR ZPB45BL7R0A	QNZZ45BL7R0A
RCV101	REMOCON RECEIVE UNIT MIM-93M8DKL or	USESJRSUNT02
	REMOCON RECEIVE UNIT PIC-26042SR-2 or	USESJRSKK032
	REMOCON RECEIVE UNIT PIC-37042SR	USESJRSKK034
RL601⚠	POWER RELAY SDT-S-112LMR or	MRNDC12QN014
⚠	POWER RELAY RPEF-12-901 or	MRNDC12KB002
⚠	RELAY ALKS321	MRNDC12MS013
SA601⚠	SURGE ABSORBER PVR-07D471KB or	NVQZ07D471KB
⚠	SURGE ABSORBER CNR-07D471K or	NVQZR07D471K
⚠	SURGE ABSORBER AVR-S07D471KAAS or	QVQZ0AVRS07D
⚠	SURGE ABSORBER JVR-07N471K or	NVQZVR07N471
⚠	VARISTOR ENC471D-07A	QVQZ0471D07A
SF1	SAW FILTER SAFGM45M7VHHZC0B03	FBB456PMR008
T571⚠	FLYBACK TRANS BSC25-2096S or	LTF00CPS2028
⚠	FLYBACK TRANS BSC28-0730 or	LTF00CPP1011
⚠	FLYBACK TRANSFORMER JF0501-2167	LTF00CPXB030
T572⚠	HORIZONTAL DRAIVE TRANS CSA-LF161	LTH00CPSA003
T601⚠	SWITCHING TRANS 02711 or	LTT00CPKT102
⚠	SWITCHING TRANS CSA-SW0197	LTT00CPSA134
TH551	PCB JUMPER D0.6-P5.0	JW5.0T
TP300	PCB JUMPER D0.6-P10.0	JW10.0T
TP301	PCB JUMPER D0.6-P10.0	JW10.0T
TP302	PCB JUMPER D0.6-P10.0	JW10.0T
TP591	PCB JUMPER D0.6-P5.0	JW5.0T
TP592	PCB JUMPER D0.6-P5.0	JW5.0T
TP601	PCB JUMPER D0.6-P10.0	JW10.0T
TU1	TUNER B8135AP or	UTUNNTUSP023
	TUNER ENV56DC9G3	UTUNNTUMS010
VR561	CARBON P.O.T. 30k Ω B or	VRCB303KA011
	CARBON P.O.T. 30k Ω B	VRCB303HH014
VR562	CARBON P.O.T. 5k Ω B or	VRCB502KA011
	CARBON P.O.T. 5k Ω B	VRCB502HH014
VR661⚠	CARBON P.O.T. 50k Ω B or	VRCB503KA011
⚠	CARBON P.O.T. 50k Ω B	VRCB503HH014
X301	X'TAL 3.579545 MHz or	FXD355LLN003
	X'TAL 3.579545MHz(30PPM)	FXD355LCHE01
X441	CERAMIC RESONATOR ZTB378F2 or	FY0374PLN001
	CERAMIC RESONATOR CSB378F2	FY0374PMR001

CRT CBA

Ref. No.	Description	Part No.
	CRT CBA Consists of the following	----------
	CAPACITORS	
C1501	CERAMIC CAP. B K 1000pF/2KV or	CCD3DKD0B102
	CERAMIC CAP. B K 1000pF/2KV or	CCD3DKP0B102
	CERAMIC CAP. 1000pF/2KV	CA3D102PAN04
C1502	ELECTROLYTIC CAP. 47µF/16V M or	CE1CMASTL470
	ELECTROLYTIC CAP. 47µF/16V M	CE1CMASDL470
C1511	CERAMIC CAP.(AX) B K 270pF/50V	CCA1JKT0B271
C1521	CERAMIC CAP.(AX) B K 270pF/50V	CCA1JKT0B271
C1531	CERAMIC CAP.(AX) B K 270pF/50V	CCA1JKT0B271
	CONNECTOR	
CN1501	PIN CONNECTOR 005P-5100	JTEA001TG001
	COILS	
L1511	PCB JUMPER D0.6-P5.0	JW5.0T
L1521	PCB JUMPER D0.6-P5.0	JW5.0T
L1531	PCB JUMPER D0.6-P5.0	JW5.0T
	TRANSISTORS	
Q1512	TRANSISTOR KTC3503Y or	NQWY0KTC3503
	TRANSISTOR 2SC3619	QQ9Z02SC3619
Q1522	TRANSISTOR KTC3503Y or	NQWY0KTC3503
	TRANSISTOR 2SC3619	QQ9Z02SC3619
Q1532	TRANSISTOR KTC3503Y or	NQWY0KTC3503
	TRANSISTOR 2SC3619	QQ9Z02SC3619
	RESISTORS	
R1510⚠	METAL RESISTOR 3W J 10k Ω or	RN03103ZU001
⚠	FIXED METAL OXIDE FILM RES. 3W J 10k Ω	RN03103DP005
R1511	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R1512	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R1515	CARBON RES. 1/4W J 2.7k Ω	RCX4JATZ0272
R1518	CARBON RES. 1/4W J 330 Ω	RCX4JATZ0331
R1519	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R1520⚠	METAL RESISTOR 3W J 10k Ω or	RN03103ZU001
⚠	FIXED METAL OXIDE FILM RES. 3W J 10k Ω	RN03103DP005
R1521	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R1522	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R1525	CARBON RES. 1/4W J 2.7k Ω	RCX4JATZ0272
R1528	CARBON RES. 1/4W J 330 Ω	RCX4JATZ0331
R1529	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R1530⚠	METAL RESISTOR 3W J 10k Ω or	RN03103ZU001
⚠	FIXED METAL OXIDE FILM RES. 3W J 10k Ω	RN03103DP005
R1531	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R1532	CARBON RES. 1/4W J 1.5k Ω	RCX4JATZ0152
R1535	CARBON RES. 1/4W J 2.7k Ω	RCX4JATZ0272
R1538	CARBON RES. 1/4W J 330 Ω	RCX4JATZ0331
R1539	CARBON RES. 1/4W J 100 Ω	RCX4JATZ0101
R1541	PCB JUMPER D0.6-P5.0	JW5.0T
R1542	PCB JUMPER D0.6-P5.0	JW5.0T
R1543	PCB JUMPER D0.6-P5.0	JW5.0T
	MISCELLANEOUS	
BC1501	BEAD INDUCTORS FBR07HA121TB-00	1LBF00ZTU021
JK1501⚠	CRT SOCKET ISHS40ST or	JSCC290PK006
⚠	CRT SOCKET HPS0521-012212	JSCC290HD012
JS1551	PCB JUMPER D0.6-P5.0	JW5.0T
TP1501	PCB JUMPER D0.6-P10.0	JW10.0T
TP1502	PCB JUMPER D0.6-P10.0	JW10.0T

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